OVERSIGHT ON THE FEDERAL AVIATION ADMINISTRATION FISCAL YEAR 1988 RESEARCH, ENGINEERING AND DEVELOPMENT BUDGET REQUEST

HEARINGS

BEFORE THE

SUBCOMMITTEE ON TRANSPORTATION, AVIATION AND MATERIALS

OF THE

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY HOUSE OF REPRESENTATIVES

ONE HUNDREDTH CONGRESS

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**Resigned February 19, 1987 (H. Res. 89).
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OVERSIGHT ON THE FEDERAL AVIATION ADMINISTRATION FISCAL YEAR 1988 RESEARCH, ENGINEERING, AND DEVELOPMENT BUDGET REQUEST

TUESDAY, MARCH 24, 1987

HOUSE OF REPRESENTATIVES, COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY, SUBCOMMITTEE ON TRANSPORTATION, AVIATION AND MATERIALS,

Washington, DC.

The subcommittee met, pursuant to notice, at 2:00 P.M., in Room 2324, Rayburn House Office Building, the Honorable Dave McCurdy (chairman of the subcommittee) presiding.

Mr. MCCURDY. Today the subcommittee will turn its attention to yet another area of its authorization responsibility, the research programs of the Federal Aviation Administration. These programs, while relatively small in total dollar value, are extremely important because they lay the foundation for many billions of dollars in expenditures for future air traffic control equipment.

They are also important because they provide the basis for formulating future air safety regulations which will be needed as aviation technology continues to evolve.

The subcommittee reviews these programs each year because research needs change continually as new ideas and priorities emerge. This year it is particularly important, however, because the previous authorization, the Airport and Airway Improvement Act of 1982, expires this year. So we will be reporting new legislation this year along with the Public Works Committee.

In our hearings today and tomorrow, we plan to reverse our usual order. Normally we hear first from the agency, followed by outside witnesses. This time we plan to focus first on the aviation groups that pay the costs of FAA research, the users of the air system. We want to give these groups an opportunity to express their views as to the adequacy of the proposed FAA program for fiscal year 1988 and beyond. Then we will give the FAA a chance to respond tomorrow.

We have a panel this afternoon, a distinguished panel, and I am going to ask that each of them come forward and take seats. It is going to be about six to one here today on the subcommittee.

First we have Roger Fleming, Senior Vice President, Technical Services, Air Transport Association of America; John Sheehan, Senior Vice President, Aircraft Owners and Pilots Association; Captain Louis McNair, Executive Central Air Safety Chairman, Air

Line Pilots Association; Suzette Matthews, General Counsel, Air Traffic Control Association; and William Power, Vice President, Government Affairs, National Air Transport Association.

Ladies and gentlemen, welcome to the subcommittee. We certainly look forward to receiving your testimony and appreciate your willingness to appear before us this afternoon.

I am going to proceed in the order of appearance here with Mr. Fleming as our first witness. In each of these instances, if you have full written testimony they will be admitted into the record as printed, and we would appreciate it if you could generally summarize and hit the major points in contention or your suggestions and recommendations or whatever it might be, and that way, because of the number of witnesses, we might be able to proceed more quickly.

Mr. Fleming.

STATEMENT OF J. ROGER FLEMING, SENIOR VICE PRESIDENT, TECHNICAL SERVICES, AIR TRANSPORT ASSOCIATION OF AMERICA

Mr. FLEMING. Thank you, Mr. Chairman.

I appreciate the opportunity to appear here today to give the committee our views on what clearly is the most crucial issue facing aviation today, the future of our national airport and airway system, as you have already noted.

The issues involved here are complex. We are at a turning point, a point when current decisions we make will have a significant influence on the nature of air transportation well into the next century. The challenges we all face, stated simply, are to provide public air transportation and all of aviation with an airport and airways system that is safe, a system that meets the public demands placed on it for capacity and efficiency, and flexible enough to keep pace with the deregulated, competitive, dynamic air transportation industry.

The challenges are formidable, but we don't lack for resources, technology or desire. We are, however, lacking for adequate commitment and funding to provide the national air transportation system this country needs.

In 1970 and again in 1982 and now in conjunction with reauthorization legislation, we are focusing on the same problems and the debate is revolving around the same concerns. There are intolerable air traffic delays, dissatisfaction about lagging investment in needed safety and capacity improvements, and the inadequacy of the nation's airport and airways system to meet public air travel demands.

In recent years there has been intense congressional attention to airport and airway problems as air travel frustrations have mounted because the aviation system is still plagued by the same problems that have existed for years. In the early 1980s, the National Airspace System Plan was developed to alleviate these deficiencies, but every step of the modernization plan is getting delayed and every program slippage has a consequence that we can ill afford if the system is going to meet the demands of the American traveling and shipping public.

I think the best example available today of problems in ATC system modernization is provided by FAA's Advanced Automation System, a key element of the NAS plan. AAS is a complex program comprised of many discrete elements intended to provide improvements in safety and capacity and of particular importance to terminal control functions.

Without AAS, FAA will be unable to introduce automation enhancements essential to reduce risk of mid-air collisions similar to the recent tragic accidents near Cerritos and Salt Lake City, nor will FAA be able to move more expeditiously to deliver severe weather warnings of hazards such as wind shear to pilots operating in terminal areas, nor will FAA be able to improve capacity significantly in terminal air space and improve reliability of equipment essential to the controller's job.

GAO stated in recent congressional testimony that completion of AAS has fallen about eight years behind FAA's original NAS Plan schedule. FAA's current schedule shows less slippage, about three years, but the important point is that automation improvements needed now will not be introduced in the ATC system before early 1993. Ironically, GAO's criticism of FAA's acquisition strategy for the AAS program has in itself contributed significantly to the delay, perhaps as much as two years.

While it is also true that part of the delay can be attributed to FAA changes in technical specifications for some elements of the system, the major portion is due to the complexities of the procurement process and inability to fund the program adequately and consistently. The funding deficiencies are functions of our current budgeting and appropriations process and the complex relationships between the Executive and Legislative Branches.

Numerous other examples of procurement process and FAA program management deficiencies could be cited, but the AAS program provides a classic example of the complexities of the current budgeting, appropriation and procurement process and the inability of that process to respond to the needs of the airspace users and, more importantly, the traveling public.

Mr. Chairman, I am sure you would agree change is required.

During development of last year's budget request for FAA, we understand the agency had to adjust to an Office of Management and Budget passback that would produce a $1.7 billion funding shortfall in Facilities and Equipment funds through 1992. There was apparently a corresponding shortfall of $500 million in RE&D funds for the same timeframe.

My statement lists a number of important F&E and RE&D projects adversely affected by these program reductions, and I note that whereas essential RE&D program needs totalled approximately $200 million per year through 1992, the OMB passback was only $127 million.

As you know, the FAA appropriation for last year was $805 million for F&E, and $142 million for RE&D, both significantly less than FAA-projected requirements.

Turning now to the fiscal year 1988 scene, ATA believes that both the implementation or F&E and research areas of FAA's 1988 program needs are understated. Last year, FAA forecast their fiscal year 1988 funding requirement as $215 million for RE&D,

and $1.6 billion for F&E. The administration's budget request for FAA in fiscal year 1988 is $150 million for RE&D, and $1.35 billion in F&E.

In order to accommodate administration budgetary objectives for fiscal year 1988, we understand FAA adopted RE&D funding adjustments to move from a $207 million OST submission to OMB to the $150 million level in the administration's budget request. This was accomplished by transferring some of the projects to the F&E account, by deleting some projects, by reducing some of the requests, and by stretching out some of the projects.

On pages 10 and 11 of my statement I have listed some of the more important projects affected by these adjustments, which the airlines believe should be restored to originally proposed funding levels. I won't go through those now, Mr. Chairman.

The FAA program funding levels reflected in the administration's proposed reauthorization legislation for fiscal years 1988 and 1989 on F&E and RE&D are inconsistent with previously stated funding requirements. In order for FAA to adhere to the schedule established in the 1986 NAS Plan, the fiscal year 1988 and 1989 F&E funding levels should be $1.615 billion for F&E for each year, and the RE&D funding levels for fiscal year 1988 and 1989 should be authorized at approximately $225 million annually.

On page 12 of my statement I list six RE&D projects which should be accelerated by funding at higher levels for fiscal year 1988 than proposed in the administration's budget request, and the amounts indicated are funding increments. I am sure it will not escape Captain McNair's attention that there is a substantial amount of additional money recommended for the TCAS horizontal maneuvers limited installation program. He will tell you the reasons why.

There are, of course, a myriad of other projects and equipment embraced by the NAS Plan which must be adequately funded if the NAS Plan is to stay close to the 1986 schedule. Since the FAA was unable to obtain fully-authorized F&E funding in 1987, the agency must receive additional funds in this and subsequent years to assure that major programs are not further deferred.

Mr. Chairman, the NAS Plan has lost much of its momentum and has fallen behind schedule, as was predicted if FAA didn't receive adequate funds to carry out the program. There appears to be more concern about cost-benefit analysis, reducing production risks and improving workforce productivity than about widespread obsolescence of existing equipment, improved safety features and increased system capacity to meet the demands of air traffic.

It is becoming more and more difficult to realize needed NAS Plan benefits when FAA is unsuccessful in obtaining funds required to complete the program. Your continuing support for efforts to expedite safety and capacity improvements coincident with modernization of the ATC system is vital.

Turning now to other important aspects of our national aviation system, the airlines place top priority on enhancing the aviation safety record. We believe that NASA should expand coordinated research with the FAA to implement near-term enhancements in safety of flight, capacity and efficiency of the national airport and

air space system and certification of new technology resulting from NASA transport aircraft research.

On behalf of the ATA member carriers who are also end users of NASA research, ATA recently submitted comments on the NASA fiscal year 1988 aeronautics budget request to this subcommittee. Air carrier comments on aviation safety needs were offered in the context of the 1987 ATA Safety Agenda, which defines the airlines' priority safety program, and a copy of that agenda was attached to that submission.

Mr. Chairman, we need improved coordination between FAA and NASA on the safety programs that I have enumerated on page 15 and on other programs where NASA's special expertise can be utilized to advantage.

I would like to take this opportunity now to reemphasize strong ATA air carrier support for the essential FAA programs we have identified in this statement. It is time to find ways to bring the NAS Plan closer to original schedule, in particular the Advanced Automation System, rather than find ways to slow projects down. Essential FAA safety and capacity programs must be moved ahead.

In short, we ask the Congress for support to provide the resources and direction to FAA to increase the momentum of NAS modernization and needed safety enhancements. To do less is a disservice to the traveling and shipping public who have already paid for the improved efficiency, capacity and safety that would be gained. There needs to be an immediate and determined national effort to get air space modernization completed. The national air transportation system is stagnating.

We realize how difficult it is to overcome deficits, differences of opinion and lethargy, but overcome we must.

That concludes my statement, Mr. Chairman. I will be happy to respond to any questions you may have.

[The prepared statement of Mr. J. Roger Fleming follows:]

Statement of J. Roger Fleming,
Senior Vice President - Technical Services
Air Transport Association
Before the House Committee on Science
Space and Technology, Subcommittee on
Transportation Aviation and Materials
on FAA's Research, Engineering and Development
Program and the National Airspace System Plan
March 24, 1987

Good afternoon Mr. Chairman. My name is Roger Fleming. I am Senior Vice President, Technical Services of the Air Transport Association, which represents U.S. scheduled air carriers. I appreciate the opportunity to appear here today to give the committee our views on what clearly is the most crucial issue facing American aviation today - the future of our national airport and airway system. The actions of this committee will help determine what future lies ahead for aviation in this country.

The issues involved here are complex. We are at a turning point - a point when current decisions we make will have a significant influence on the nature of air transportation well into the next century.

Air carriers face a unique requirement for an American industry, because unlike any other enterprise, they cannot provide their product without direct involvement of the federally operated air traffic control system.

The challenges we all face, stated simply, are to provide public air transportation and all of aviation with an airport and airway system that is safe; a system that meets the public demands placed on it for capacity and efficiency and flexible enough to keep pace with a deregulated, competitive, dynamic air transportation industry.

These challenges are formidable. But we do not lack for resources. We do not lack for technology. And we do not lack for desire. We are, however, lacking for adequate commitment and funding to provide the national air transportation system this country needs.

During a period that now covers three decades there has been periodic reexamination of the problems and needs of our national air transportation system, and how they might best be addressed. The Declaration of Policy in the Airport and Airway Development Act of 1970 includes statements identifying these problems and needs:

- That the Nation's airport and airway system is inadequate to meet the current and projected growth in aviation.

- That substantial expansion and improvement of the airport and airway system is required to meet the demands of interstate commerce, the Postal Service, and the national defense.

When Congress passed reauthorization legislation in 1982, the Declaration of Policy stated:

- The continuation of airport and airway improvement programs and more effective management and utilization of the Nation's airport and airway system are required to meet the current and projected growth of aviation and the requirements of interstate commerce, the Postal Service, and the national defense.

In 1970, again in 1982, and now in conjunction with reauthorization legislation, we are focusing on the same problems and the debate is revolving around the same concerns. There are intolerable air traffic delays, dissatisfaction about lagging investment in needed safety and capacity improvements and the inadequacy of the nation's airport and airway system to meet public air travel demands.

In recent years, there has been intense Congressional attention to airport/airway problems as air travel frustrations have mounted because the aviation system is still plagued by the same problems that have existed for years.

In the early 1980s, the National Airspace System Plan (NAS Plan) was developed to alleviate these deficiencies. ATA and other user groups agreed to higher user charges to fund the NAS Plan and needed airport improvements. The revenues flowed and continue to flow into the Trust Fund, but appropriations have not been made at the levels authorized and necessary to modernize to meet current or projected future demand for services.

Every step of the modernization plan is getting delayed. Every program slippage has a consequence that we can ill-afford if the system is going to meet the demands of the American public. 1986 was the first year that full-funding was abandoned for some NAS Plan programs. There are troubling ramifications to that action. If FAA is required to obtain approval and appropriations for each major step in the program, each year, there is a real risk of instability in funding levels. This inevitably leads to stops, starts, contractor lay-offs, and cumulative delays in the entire program.

The best example available today of problems in ATC system modernization is provided by FAA's Advanced Automation System (AAS) -- a key element of the NAS Plan. AAS is a complex program, comprised of many discrete elements, intended to provide improvements in safety and capacity, and of particular importance to terminal control functions. Without AAS, FAA will be unable to introduce automation enhancements essential to reduce risk of mid-air collisions similar to the recent tragic accidents near Cerritos, California, and Salt Lake City, Utah. Nor will FAA be able to more expeditiously deliver severe weather warnings of hazards such as wind shear to pilots operating in terminal areas, nor will FAA be able to improve capacity significantly in terminal airspace and improve reliability of equipment essential to the controller's job.

The General Accounting Office (GAO) stated in recent Congressional testimony that completion of the AAS program has fallen about 8 years behind FAA's original NAS Plan schedule. FAA's current schedule shows less slippage -- about 3 years. But the important point is that automation improvements needed now will not be introduced in the ATC system before early 1993!

Ironically, GAO criticism of FAA's acquisition strategy for AAS has contributed significantly to the delay in AAS

procurement--perhaps as much as 2 years. While it is also true that part of the delay can be attributed to FAA changes in technical specifications for some elements of the AAS system, the major portion is due to the complexities of the procurement process and inability to fund the program adequately and consistently. The funding deficiencies are functions of our current budgeting and appropriations process and the complex relationships between the Executive and Legislative Branches.

Numerous other examples of procurement process and FAA program management deficiencies can be cited. For example, failure to procure in a timely manner needed Airport Surface Detection Equipment and transmissometers to measure visibility at airport runways. But the AAS program provides a classic example of the byzantine complexities of the current budgeting, appropriation, and procurement process and the inability of that process to respond to the needs of the airspace users and, more importantly, the traveling public. Change is required!

During development of last year's budget request for FAA we understand the Agency had to adjust to an Office of Management and Budget passback that would produce a $1.7 billion funding shortfall in Facilities and Equipment funds through 1992. There was apparently a corresponding shortfall of $500 million in Research, Engineering and Development funds for the same time frame. Within the F&E account we understand

FAA projected an impact on the Advanced Automation System program, which represents 33 percent of the out-year F&E requirements, of $200 million. In order to fiscally manage the remaining $1.5 billion reduction in F&E, FAA also identified impacts on the following programs:

Host Computers	$ 46 million
Airport Traffic Control Towers	$ 24 million
Flight Service Automation System	$ 26 million
Weather Communication Processor	$ 7 million
VORTAC Navigation	$ 65 million
MLS	$307 million
Mode S	$167 million
Terminal Radar	$ 53 million
Enroute Radar (ARSR-4)	$103 million
LORAN C	$ 8 million
Remote Control Equipment	$ 45 million
Remote Maintenance Monitoring	$ 20 million
Aircraft	$ 9 million
System Engineering Integration	$ 86 million
General Support	$ 86 million
Terminal Doppler Weather Radar	$435 million

The programs in the FY 1987 R, E&D request to support safety needs, the NAS Plan, and to develop follow-on system improvement through the year 2010 were:

Security and Safety Improvements

Capacity Improvements

Weather System Improvements

Utilization of Satellite Technology

Higher Levels of Automation

These programs required R, E&D funding levels of approximately $200 million per year through 1992. The OMB passback was apparently 127 million per year.

The FAA appropriation for last year was $805 million for F&E and $142 million for R, E&D - both significantly less than FAA projected requirements.

Overall, ATA believes that both the implementation (F&E) and research areas of FAA's 1988 program needs are understated. Last year FAA forecast their FY 1988 funding requirement as $215 million for Research, Engineering and Development (R, E&D) and $1.615 billion for Facilities and Equipment (F&E). The Administration's budget request for FAA in FY 1988 is $150 million for R, E&D and $1.35 billion in F&E.

In order to accommodate this significant difference in the R, E&D submission FAA had to cut many of their R, E&D projects. These projects are extremely important to the

progress of the NAS Plan, and to needed safety improvements and vital airport capacity enhancements. Some of the more significant safety and capacity enhancing R, E&D projects are:

- Terminal Automation.

- Improved sensors and procedures to provide for reduced separation for independent parallel and converging runway operations.

- Data link communications.

In order to accommodate Administration budgetary objectives for FY 1988, we understand FAA adopted R, E&D funding adjustments to move from a $207 million OST submission to OMB to the $150 million level in the Administration's budget request. This was accomplished by transferring some of the projects to the F&E account, by deleting some projects, by reducing some of the requests, and by stretching out some of the projects.

Some of the more important projects affected by these adjustments, which we believe should be restored, include:

Deleted Projects

	(In Thousands)
Centralized Weather Information Processing	$ 400
Low Level Wind Shear Advisory Enhancements	$ 600
Advanced Weather Devices and Sensors	$ 1,250
Weather Research	$ 600

Projects Reduced or Stretched Out

Terminal/Tower Control	$ 1,600
Airport Capacity Enhancement Demonstrations	$ 6,900
Airport Capacity Data Collection Efforts	$ 600
Airport/Airspace Planning	$ 700
Wake Vortex Detection and Separation	$ 600
Airport Design Improvements	$ 800
Data Link	$ 200
National Airspace System Development Studies	$ 850
Advanced Concepts Studies	$ 500
Separation Standards	$ 275
User Preferred Trajectories	$ 490
Advanced Traffic Management Systems	$ 400
Dynamic Special Use Airspace Management	$ 100

Oceanic Traffic Management	$ 450
Terminal ATC Automation	$ 1,850
Automatic Dependent Surveillance	$ 2,000
Flight Crew Human Factors	$ 2,275
Airport Safety Planning	$ 200
Airport Surface Visual Control	$ 250
Airport Safety Support System	$ 100
All Weather Taxiway Guidance	$ 350
Aircraft Takeoff/Landing Advisory Systems	$ 350
Controller Human Factors	$ 1,700
Satellite Technology	$ 2,700

The FAA program funding levels reflected in the Administration's proposed reauthorization legislation for FY 1988 and FY 1989 on F&E and R, E&D are inconsistent with previously stated funding requirements. In order for FAA to adhere to the schedule established in the 1986 NAS Plan, the FY 1988 and FY 1989 F&E funding levels should be $1.615 billion for each year. The R, E&D funding levels for FY 1988 and 1989 should be authorized at approximately $225 million annually.

The ATA member carriers believe the following R, E&D projects should be accelerated by funding at higher levels for FY 1988 than proposed in the Administration's budget request (the amounts listed are recommended funding increments):

(In Thousands)

Airborne Wind Shear Detection	$ 5,000
Curved and Segmented Approaches (Civil Wide-Body Demonstration)	$ 3,500
AERA III	$10,000
TCAS Horizontal Maneuvers LIP	$10,000
Data Link	$ 1,300
Airport Capacity	$ 6,000

There are, of course, a myriad of projects and equipment embraced by the NAS Plan. FAA is in the process of improving their long range surveillance radar systems, next generation weather radars and terminal Doppler weather radar systems to detect severe weather phenomena such as wind shear and microbursts in both terminal and enroute environments.

Some of the other important programs started in years prior to FY '87 which require continued funding to assure they have reasonable assurance of remaining on schedule are replacement and modernization of control towers and terminal radar control facilities; improved airport radar surveillance systems (ASR-9); a central weather processing system to collect and disseminate important weather information to controllers and automated weather observation systems. In addition,

adequate funding and support for the FAA systems engineering and integration contract is required.

Since FAA was unable to obtain fully authorized F&E funding in FY '87, the Agency must receive additional funds in this and subsequent years to assure that major programs are not further deferred.

The difference between the FY 1988 F&E budget request and the FAA forecasted requirement was accommodated by replanning the Advanced Automation System and reducing the number of MLS systems. Conspicuously absent from this request is funding for 22 additional Instrument Landing Systems (ILS) at key hub airports. These systems could help alleviate delays that today are written off to weather. This is one time when something can be done about the weather rather than just talk about it.

Mr. Chairman, the NAS Plan has lost much of its momentum and has fallen behind schedule, as was predicted if FAA didn't receive adequate funds to carry out the program. There appears to be more concern about cost/benefit analysis, reducing production risks, and improving workforce productivity than about widespread obsolescence of existing equipment, improved safety features, and increased system capacity to meet the

burgeoning demand of air traffic. It is becoming more and more difficult to realize needed NAS Plan benefits when FAA is unsuccessful in obtaining funds required to complete the program. Your continuing support for efforts to expedite safety and capacity improvements coincident with modernization of the ATC system is vital.

The airlines place top priority on enhancing the aviation safety record. We believe that NASA should expand coordinated research with the FAA to implement near term enhancements in safety-of-flight, the capacity and efficiency of the national airport and airspace system and certification of new technology resulting from NASA transport aircraft research. We also foresee a strong NASA role in implementing the eight action items announced in the February, 1987 report by the Office of Science and Technology Policy (OSTP); "Agenda for Achievement, National Aeronautical R&D Goals".

On behalf of the ATA member carriers who are also end users of NASA research, ATA recently submitted comments on the NASA FY 1988 Aeronautics Budget request to this Subcommittee. Our comments covered three main areas: aviation safety, NASA's role in supporting modernization of the National Airspace System and research for future transport aircraft development. ATA carrier comments on aviation safety needs were offered in

the context of the 1987 ATA Safety Agenda, which defines the airlines priority safety program. NASA research is directly involved in several programs in the safety Agenda dealing with Safety of Flight:

- Reducing the risk of mid-air collisions
- Elimination of encounters with hazardous wind-shear
- Human factors

The Aviation Safety Reporting System (ASRS), managed by NASA for the FAA, is extremely useful in identifying safety problems that should be studied. But FAA funding (O&M) for this program has not kept pace with a greatly increased volume of reports. Accordingly, there is a need to expand ASRS, whether funded by FAA, or jointly by NASA and FAA.

I'd like to take this opportunity to reemphasize strong ATA air carrier support for essential FAA programs we have identified in this statement.

It is time to find ways to bring the NAS Plan closer to original schedule, in particular the Advanced Automation System, rather than find ways to slow projects down. Essential FAA safety and capacity programs must be moved ahead.

In short, we ask the Congress for support to provide the resources and the direction to FAA to increase the momentum of NAS modernation and needed safety enhancements. Tc do less is a disservice to the traveling and shipping public who have already paid for the improved efficiency, capacity, and safety that would be gained.

There needs to be an immediate and determined national effort to get airspace modernization completed. The national air transportation system is stagnating. We realize how difficult it is to overcome deficits, differences of opinion and lethargy, but overcome we must.

That concludes my prepared statement, Mr. Chairman. I will be happy to respond to any questions you might have.

Mr. McCURDY. Thank you, Mr. Fleming.

I am going to reserve questions or withhold questions until the panel has completely given their statements. I appreciate your statement, and we will be back with you shortly.

Mr. Sheehan.

STATEMENT OF JOHN J. SHEEHAN, SENIOR VICE PRESIDENT, AIRCRAFT OWNERS AND PILOTS ASSOCIATION

Mr. SHEEHAN. Good afternoon, Mr. Chairman. It is a pleasure to be here to talk about something we are certainly very interested in.

The National Airspace System Plan, as we have already heard, is behind up to eight years. Costs have grown by 50 percent and may grow to a total of 100 percent over budget by the end of the program, if, in fact, there is such a thing as the end of the NAS, and portions have been totally abandoned or deferred way out into the future.

The high payoff items, such as the Advanced Automation System, the Automated Flight Service Station System, and the NEXRAD Weather Radar, have been the most significantly delayed. These are the ones that are some of the centerpieces of the system. These centerpieces have dependencies on many of the other parts of the system. In all, there are in excess of 90 separate projects within the NAS, and all these fit together to one degree or another.

So when one or the other gets behind by one, five, seven, eight years, there is a danger that it will be difficult to integrate these programs downstream.

The FAA has always had a very plausible excuse for this happening: program delays, funding shortfalls, that sort of thing. They are all very plausible excuses, but what they add up to is what we consider to be an ever-receding horizon. It is like a bad dream of running to catch up to something and you can never get it. That is exactly what the NAS is coming to.

We want these programs to work. There is a great benefit to us in general aviation, and yes, everybody in aviation, but we want to make sure that, number one, these programs are the programs that we signed up for over six years ago, and number two, that they have not overcome by events and, even more serious, overcome by technology.

It will cost the general aviation fleet between $3 billion and $6 billion to reequip our aircraft to accommodate new transponders, new precision approach receivers, new altimeters, new navigation systems, and perhaps even data link. With this at stake, we want to make sure it works.

Because of these elements, we feel that this is high time that all elements of the NAS be reevaluated to see that, number one, are they still applicable, number two, will they fit with the long-range downstream programs, and even worse, as I said before, have some of these programs become overcome by technology.

Now, recently the FAA has taken steps to improve the NAS program. There is a NAS program manager, a czar, if you will, who has been assigned to oversee all of these projects. We sincerely

hope that his task is not akin to switching the skippers of the Titanic just before the collision, although that might happen.

In Attachment A to my testimony, I have listed some seven projects that we feel very strongly about that we are not getting there from here. I won't go into those in any detail, but will switch to the RE&D aspect of the testimony.

In fiscal year 1988 $150 million is programmed for RE&D projects. That is only part of the story. The biggest part of the story, from the way we view it, is what has been left out of that $150 million? That is the most important part.

For instance, out of that $150 million, only 9 percent has been allocated to systems capacity and delay reduction projects. We know for a fact that some $12 million has not been included that will look at parallel and converging instrument approaches, improved sensors and improved separation standards.

It seems to me that priority A now for the FAA is to close in on some of the capacity and delay problems. These particular programs I have just mentioned have been identified as much as five years ago. Still, we can't seem to get the money to conclude this very critical research.

Human factors research has always been the poor stepchild of RE&D within the FAA. Factors such as cockpit displays, operational efficiency, training methods and the like are critical to aviation safety. We don't have a lot of money in the budget this year for human factors research; it is sorely needed.

The thing that makes me wonder the most is why there is only five percent of the R&ED budget earmarked for future systems definition? This is the thing that is going to get us into the 21st Century. The NAS Plan, if it ever gets completed, will leave us off just before the 21st Century, leaving nothing out into the future.

Within the past two years, industry itself has spurred the FAA to think about future systems development, with a very comprehensive work done by the Radiotechnical Commission for Aeronautics, so-called SC155 study, that has urged the FAA to get into the future systems definition business and, more specifically, satellites.

This is essential work. It must be done if we are going to get into the 21st Century and survive there with our burgeoning air transportation system.

Mr. Fleming gave one estimate of how much we are underbudgeted. I will be a very conservative person and say we are underbudgeted by somewhere between $20 million and $40 million for what we consider to be critical R&D projects. I might add that this is all trust fund money. This is 100 percent funded by the users. So I guess I keep coming back to the question why can't we get those essential funds?

Finally, let's look at R&D management. R&D management within the FAA is terribly fragmented. There is no central direction or oversight for RE&D. Each one of the operating branches within the FAA has their own ax to grind when it comes to R&D, and basically, it is a fight for scarce dollars. There is no central section of the FAA that pretends to analyze those needs on a systematic basis.

So what we have is a hodgepodge of diverse efforts throughout the agency. This must be stopped if we are going to have a comprehensive view of the future.

In summary, obviously the NASP is off to a slow start. We don't think the FAA is looking at the progress from NASP in the proper manner. Their milestones include things like contracts awarded, percent of funds obligated, percent of plans in progress. These are not true indicators of progress; these are true indicators of how much paper they can shuffle.

The true indicators of progress have to be systems defined and analyzed, hardware installed, tested and certified. We are not seeing those measures. We are not getting there.

I have a fear that the demand may have outstripped the ability of the NAS Plan to accommodate our ever-increasing transportation needs. Even more than that, as I have stated before, we may have been overcome by advancing technology.

I would like to go back to what one of your predecessors sitting in that seat about two years ago, Congressman Glickman, said. He said: I have this recurring dream that we get to the end of the NAS Plan, we have spent all $12 billion, and the system doesn't work. I echo those sentiments, and I would say his dream is getting closer to reality.

We need a new sense of urgency concerning NASP. We need to use the R&D programs of the FAA to serve the NASP in the near term. More importantly for what comes after the NASP, we need renewed attention for the program content and management for RE&D. But more than anything, RE&D has to be our guide.

Thank you very much.

[The prepared statement of Mr. John J. Sheehan follows:]

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STATEMENT OF JOHN J. SHEEHAN
SENIOR VICE PRESIDENT
AIRCRAFT OWNERS AND PILOTS ASSOCIATION

Regarding FAA Research, Engineering and Development (RE&D)

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
SUBCOMMITTEE ON TRANSPORTATION, AVIATION AND MATERIALS
U.S. HOUSE OF REPRESENTATIVES
HONORABLE DAVE McCURDY, CHAIRMAN
MARCH 24, 1987

The Aircraft Owners and Pilots Association (AOPA) represents the interests of 260,000 general aviation aircraft owners and pilots who fly the majority of all business and personal hours flown in the United States. Our members are the chief beneficiaries of system safety and capacity improvements. For every airliner that takes off, 50 general aviation departures occur. For every airport served by an airline, general aviation serves 24. Clearly, our interest in airspace and airway modernization is a continuing one.

National Airspace System Plan (NASP)

AOPA has been the most severe critic of the National Airspace System Plan since its inception. We felt that the plan was a loosely connected group of largely unrelated projects that would not lend themselves to the systems approach. We felt that many of the programs were overly ambitious due to the requirement for as yet uninvented technology and the great complexity involved. Finally, we felt that the Plan was so extensive that changing requirements and technology would overtake many of the programs involved.

As we have seen the Plan evolve, many of our fears have been realized. Major portions of the NASP have slipped by as much as seven years; total program costs have grown by 50%; and portions of the Plan have been abandoned or indefinitely deferred. While some elements have progressed as planned, these have largely used existing technology and have not required integration with other programs. The high-payoff items such as the Advanced Automation System (AAS), Automated Flight Service Stations (AFSS), and Next Generation Weather Radar (NEXRAD) have fallen far short of schedule and promised benefits.

We have repeatedly appeared before this committee and others within the Congress to chronicle the deficiencies of the NASP. In rebuttal, the FAA has always provided eminently plausible reasons for planning and programming delays, coupled with assurances for rapid return to schedule. Their reasons and assurances have lulled all of us into a false sense of security, a promise of solutions just around the corner.

Now that we are five years into the Plan and eagerly awaiting deliverables, we see the time for completion being pushed farther and farther into the future. The rapidly expanding demands placed on the aviation system are being held hostage by an Administration unable to adequately manage essential program development. As we move into the next decade, new demands and technologies will far outstrip the flagging and ponderous NASP, leaving the users an increasingly unresponsive system.

We want to ensure that what we receive for our trust fund dollars is a system that will improve safety and our utility within it. To use the system NASP will create, each individual user will be forced to re-equip with a new transponder, precision approach receiver, upgraded altimeters, enroute navigation systems and in some cases, data link equipment. The fleet costs for this equipment will range from $3-6 billion. Therefore, we want to be quite sure we are getting what we want and need.

Now is the time to re-evaluate all elements of the NASP to ensure they are still required and properly fit into the overall plan. More importantly, the DOT and FAA must develop a new sense of urgency with regard to managing and developing the Plan. Recent management changes promise some improvement, but all concerned with the Plan must take a more aggressive and enlightened approach if we are to realize its promised benefits.

The Advanced Automation System, Microwave Landing System, Automated Flight Service Stations and a variety of proposed weather sensors are prime examples of programs that must be reexamined for appropriateness of application, proper management and suitable technology. Attachment A provides detailed comments addressing these issues for a number of vital NASP projects.

Research, Engineering and Development (RE&D) Projects

The Administration's 1988 fiscal year budget calls for $150 million for FAA RE&D. This includes funds for ongoing and proposed projects that are necessary to the future well-being of the NASP and for a limited number of future projects. This amount is simply not enough to fund immediate or future RE&D requirements for the required aviation system needs for this nation.

System capacity problems have reached the critical point for many of our major metropolitan areas. Only 9 percent of the RE&D budget is earmarked for capacity improvement and delay reduction. An essential part of this effort should be devoted to finding ways to make airports more efficient, yet $12 million of airport capacity improvement items are not included in the budget request. Research requirements for converging and parallel instrument approaches, improved terminal sensors, and reduced longitudinal separation have been recognized for years as areas where real capacity gains may be realized; why have they not been included in the budget?

Human factors research has always been a poor stepchild of FAA research efforts. Most of this effort has been handed over to the National Aeronautics and Space Administration, but their efforts may not be focused adequately in

real-world aviation needs, particularly in general aviation. Cockpit displays, operational efficiency, training methods and pilot stress are among areas where safety and efficiency gains can be made. Very little of this type of work is included in the FY 1988 budget.

Perhaps the greatest long-term research needs are for future systems definition. Satellite systems promise great improvements for all forms of aviation in terms of communication, navigation and surveillance. Recent U.S. and international efforts have clearly identified these benefits and developed conceptual plans for implementing these systems. Much work must be done in basic research to bring these concepts to maturity, yet only 5 percent of the RE&D budget has been allocated to this essential activity.

For some time we have been concerned that the FAA has not examined the rapidly approaching satellite revolution in aviation. Just within the past year, the international community has made quite clear its intention to proceed rapidly with satellite technology for aviation, so we must rapidly address this issue if we are to gain the maximum benefit from the technology. More importantly, the interaction between satellite systems and the existing NASP programs must be carefully examined to ensure that they are not overcome by superior technology.

Many other areas of RE&D have not received sufficient attention or funding in the upcoming budget. These include:

- Low-altitude communications and surveillance needs
- Automated Traffic Management Systems
- Airport surface traffic surveillance and conflict alert
- Weather systems improvements
- Airport surface safety projects
- Advanced wind shear sensors
- Flight safety

In all, we feel that the Administration has underfunded the RE&D budget by at least $20 million and perhaps by as much as $40 million. We urge you to task the Administration with providing a more aggressive and realistic FAA RE&D program for the future.

Additional funding should not be a problem since all RE&D programs are funded wholly from the Aviation Trust Fund (ATF), which certainly contains a handsome surplus. Since this fund is entirely user-funded, it should be used to their benefit by providing adequate RE&D.

RE&D Management

RE&D in the FAA suffers from a lack of centralized direction and oversight. The effort is treated as a loose collection of programs that is only examined as a single entity once a year at budget time. The RE&D effort is a diverse and complicated collection of near-term and future projects that are often closely interrelated and which should be managed as such and not be just another annual budget item.

The Development and Logistics branch of the FAA has the greatest single interest in the RE&D projects but is certainly not the only such office. All operating branches and some staff branches have significant amounts of RE&D requirements that suffer from the lack of a central coordinating office. The current fragmentation of these efforts has created inefficiencies in the overall effort.

While it is not clear how such a coordinating and management effort should be structured, rapid action should be taken to examine the problem and devise a solution.

Summary

The NASP has not started well and is beset with many problems. The plan must be put back on track if we are to realize the promise of this grand scheme.

We are disturbed when we hear the FAA citing the "milestones" of contracts awarded, funds obligated and percent of the Plan in progress as if these were the true measures of success. While these indices may make good press, they only serve the system designed to track real progress; they do not constitute progress themselves.

Real progress comes in the form of hardware produced and tested, systems integrated and operational evaluations conducted. These must be the true indices of progress toward full implementation of the NASP.

We must be sensitive to the time constraints imposed on us by system demand and advancing technology. If these programs are delayed to the point where demand has outstripped the potential for the Plan to accommodate it, we have lost a great deal of potential effectiveness and are placed far behind the next generation of planning. Similarly, if we allow advancing technology to overtake that used by the Plan, we have wasted much of our efforts to date and will have to work doubly hard to catch up to the next Plan.

There must be a new sense of urgency and dedication regarding the NASP if we are to realize its full potential.

Finally, the RE&D efforts within the FAA must receive renewed attention for both expanded program content and management if we are to move into the twenty-first century with the assurance that we have chosen the best possible systems. RE&D must serve the users by providing strong guidance for NASP and its successors. If this doesn't happen, we will be saddled with expensive white elephants for years to come.

ATTACHMENT A

Advanced Automation System (AAS)

This system is the centerpiece of the NASP, the highest payoff item of the Plan. But, the final implementation has slipped from 1994 to 1999, and costs have begun to rise significantly. We are quite concerned that the Administration's slavish dedication to this significantly delayed program will deny users technological advantages that may be available in the near future.

Additionally, a recent General Accounting Office (GAO) report noted that plans to award the acquisition contract before completing hardware and software development and testing and without validating functions will lead to significant increases in cost and, perhaps more damaging, extensive delays which will make the AAS obsolete before it is operational.

We are pleased that the Congress recognized many of these shortcomings and placed constraints on further FAA development and procurement initiatives as a part of the 1987 appropriations process.

Further, the validity of the cost/benefit study which the FAA uses to justify the AAS appears slightly questionable. The FAA's phased implementation of AAS, benefits taken "up-front," and various assumptions in the cost/benefit analysis lead to the conclusion that many prospective benefits will not materialize.

In a related issue, the initial Host computer (which will allow a transition to AAS) installation at the Seattle Center has taken place successfully, and we are encouraged by the 1987 delivery timetable for all 20 centers. Host appears to be one component of the NAS Plan that FAA can be justifiably proud of.

AOPA strongly recommends that all aspects of AAS implementation be reexamined to ensure that technology has not overtaken it and that the system can be integrated with satellite systems. The Host will provide for adequate capacity while this critical evaluation is conducted.

Microwave Landing System (MLS)

First introduced in the early 1970's, the MLS program is now caught between FAA commitment to continue implementation and increasing user doubts concerning the system in light of program setbacks and delays. The initial procurement of MLS ground stations is already two years late and falling further behind. In large part, advancing Instrument Landing System (ILS) technology has short-circuited many previously sold benefits of MLS.

Communities have been denied precision approach capability far longer than safety can afford due to the decision to suspend ILS installations in favor of MLS. However, we are reassured to an extent by an apparent willingness on the FAA's part to install a limited number of ILSs and to reconsider the total number of MLS units that are truly needed.

FAA cost estimates for MLS are still far from reality. The 1987 budget request asks for funds to procure MLS avionics at $78,000 per aircraft, and MLS ground stations at more than $760,000. The first number is quite high (by at least 200 percent), and the second number is low. At the most recent International Civil Aviation Organization (ICAO) meeting of the Special Committee on Future Air Navigation Systems, a report was given on one of the first attempts to procure and commission an MLS for an international airport. The cost to accomplish the installation of MLS, without acheiving current ILS approach minimum capability, exceeded estimates by a factor of three!

It is important to emphasize that FAA has not yet completed development in the MLS program which will permit use of MLS for category II or III approaches required by air carriers, nor provided assurance of the system capacity increases alleged to accompany the MLS implementation.

Despite these drawbacks, airborne avionics costs will fall to a level attractive to the broader segment of users only if air carriers, who can afford the initial, artificially high prices, "prime the pump." Installation at air carrier airports already served by ILS will stimulate avionics production while providing early benefit to the air carriers. Continuing the ILS implementation will immediately expand precision approach capability.

AOPA recommends that by 1998, the FAA install MLS at airports to meet international agreements and where ILS already exists, to realize what capacity enhancements are available. We also recommend an aggressive return to ILS installations. There are hundreds of communities which need a precision approach capability at their airports. Prompt installation of ILS at those airports is the only way that requirements can be fulfilled if they are not to wait for as much as 12 years for MLS.

Mode S

Mode S may eventually provide a limited data link capability for communication from the ground to aircraft in flight. However, it will not provide surveillance service to aircraft operating at altitudes below 8000 feet or lower at most locations. Most significantly, Mode S will never be compatible with satellite communications, the promise of the next decade. Mode S will not provide meaningful communications service until after the mid-1990's; yet, the U.S. airlines will own and operate a satellite communications system by the late 1980's.

AOPA enthusiastically supports FAA's implementation of the mono-pulse Mode S ground radar equipment because nearly all of the benefit to be derived from Mode S (radar accuracy, reduced clutter and reduced controller work load) result from that technology, not from airborne Mode S transponders. The current ATCRBS transponder is compatible with all elements of the Mode S implementation and should be protected. Further, the much-touted advantage of Mode S data link has failed to capture user acceptance and is not yet operationally proven.

Traffic Alert and Collision Avoidance System (TCAS)

The FAA has spent in excess of $50 million and more than 20 years in an effort to create a workable TCAS device. Still, we are a long way from a production-model TCAS, despite the large investment. While technology has proven a significant block to TCAS development, dedication to the concept and aggressive pursuit of solutions have been less than desired.

This program should be afforded the highest priority so that the potential safety benefits for air carriers can be realized at the earliest possible time. We are very close to the long-awaited airborne collision avoidance system; extra emphasis is needed to get this moving.

Automated Flight Service Stations (AFSS)

This initiative provides the best example of the FAA's inability to develop and implement a relatively modest single program. The theory behind this program was to provide pilots with better pre- and in-flight weather and operational services through automation. A subset of this was to have been a significant cost savings afforded by consolidating 320 manual flight service stations (FSS) into 61 AFSSs. The consolidation was to have led to the release of 25 percent of total FSS personnel by 1990 due to efficiencies gained.

The automation of the FSS system is now seven years behind schedule, and the transition to the AFSS system is littered with broken promises, inadequate performance, abandoned elements of the program, and personnel mismanagement. A program that started out with such lofty ambitions has turned out to be a monument to poor management and inefficiency.

Automation was to have been accomplished in two steps. The first step, Model 1, was to have given an initial operational capability to 37 AFSSs and an enhanced version, Model 2, was to have been installed in the remaining 24 new locations prior to being retrofit into the original 37 automated locations. While Model 1 was developed with only a slight delay, Model 2 development soon lagged so far behind that work was stopped on it in 1984. The indecision and lack of direction that ensued convinced the Congress to withhold further funding for Model 2 development. While the benefits of Model 2 will be missed, a larger problem is involved.

Without Model 2 equipment, the final 24 AFSSs cannot be automated as the equipment for those locations was a part of the Model 2 appropriation. As of today, some 116 FSSs will be consolidated into 24 non-automated "AFSSs." Immediate action must be taken to provide full capacity Model 1 automation for those locations if service levels are to remain barely adequate. None of the 116 old stations must be allowed to close prior to automation equipment being installed.

As AFSSs were to be brought on line, flight service specialists were to be slowly released, commensurate with productivity gains. Although the consolidation of FSSs has been delayed by up to seven years, the drawdown of personnel has proceeded as scheduled. As a result, there are severe staffing shortfalls in every FAA region, resulting in some 70 of the existing 200 being placed on an "emergency" part-time basis. This has denied users critical flight information during hours of darkness and in inclement weather. A minimum of 280 additional specialists are required to bring staffing levels back to an acceptable level.

This program must be put back on track to provide much-needed safety-of-flight information to pilots. Completion of Model 1 automation, continued development of Model 2 enhancements, and adequate staffing are essential to the AFSS program.

Weather Systems

Next Generation Weather Radar (NEXRAD), Automatic Weather Observation System (AWOS), Central Weather Processor (CWP), and Terminal Doppler Weather Radar (TDWR) are all programs of critical importance to us. Weather remains the single greatest cause of fatal accidents in general aviation; improvement in the ability to get accurate weather to the pilot is essential.

Full availability of these systems is up to three years behind the 1983 forecast. New emphasis must be placed on these and related programs if we are to make any progress in reducing the number of fatal accidents due to weather. These initiatives hold the highest near-term safety payoff of any single group of programs in the NASP.

System Capacity

After safety, the next greatest near-term payoff from the NASP will be ATC system and airport capacity increases. Demands on the system are increasing at a rate that may soon cause an aeronautical gridlock if new methods for accommodating this demand are not found. While the principal causes for delays are lack of adequate airports and inefficient air carrier scheduling practices, technology can yield significant incremental capacity gains.

AAS is advertised to provide the greatest capacity gain within NASP, yet other, smaller programs can help us prior to 1994. The better definition provided by Mode S, improved long-range and terminal radars and upgraded radar computers will allow closer spacing of aircraft. Improved weather detection and dissemination systems will help decrease the existing 60-percent system delays attributed to weather. New flow management programs will provide for more dynamic means of handling peak traffic. All of these items taken together will provide much-needed capacity increases.

But, many of these programs are three, four, even five years behind schedule. As with weather systems, these items must be pursued aggressively to provide needed capacity increases.

System Engineering and Intergration (SEI) Contractor

The Martin-Marietta Corporation is already three years into a ten-year, $700 million contract designed to "provide management and technical support for the implementation of the NASP." We have not seen sufficient results from this effort to justify the expense involved.

The General Accounting Office (GAO) has testified before the Congress several times regarding its concern for FAA's ability to effectively implement the NASP. It is our understanding that this was to have been one of the principal functions of the contractor. Given the critical remarks by GAO, we cannot possibly be getting much for our money.

The original contract was touted as a partnership between the contractor and the FAA. It is our impression that a true partnership was never formed and that the contractor has been relegated to a subservient role with few management powers. While the FAA has recently acknowledged that their relationship with the contractor must be changed, we have seen no substantive result of that revelation. We encourage the Congress to critically oversee the change in this relationship so we can get full value out of this important contract.

Mr. MCCURDY. Thank you very much.
Captain McNair.

STATEMENT OF LOUIS M. McNAIR, EXECUTIVE CENTRAL AIR SAFETY CHAIRMAN, AIR LINE PILOTS ASSOCIATION

Mr. MCNAIR. Thank you, Mr. Chairman.

I am Louis McNair, Executive Central Air Safety Chairman of the Air Line Pilots Association. I am testifying today on behalf of the 39,000 ALPA members who fly for 48 commercial airlines. ALPA appreciates this opportunity to appear before you today to add the voices of our membership to others in the aviation community at large in strong support of the FAA's research, engineering and development program.

We all agree that continued research and development in aviation is essential to sustain the operational capabilities of our air transportation system, provide the improvements necessary to meet additional airport capacity requirements, and provide the necessary safety improvements to the nation's air transportation system.

I would like to briefly mention and highlight some of the research and development programs, projects or activities which we feel are in need of further funding, direction, legislation, or some combination thereof. Since these programs are all safety related, they should be given special consideration.

One: Traffic Alert and Collision Avoidance System, TCAS. As you are aware, Mr. Chairman, the FAA and aviation industry over the last six years have actively been in the process of developing an independent airborne collision avoidance system. This system, called TCAS, has several versions, one of which, TCAS-II, is now actively flying in line operations in a Piedmont 727 aircraft.

This is a milestone and we applaud the accomplishments of the people involved in bringing this system to fruition. We cannot, however, endorse TCAS-II as an end product. In our opinion, the TCAS-II operational deficiencies of excessive false alarms and vertical-only escape maneuvers eliminate it as a candidate for the Air Carrier Collision Avoidance Standard.

I am sure, Mr. Chairman, you are aware that the FAA and industry have also been working on the development of a TCAS-III. As a matter of fact, this system, which is installed on an FAA Technical Center aircraft, has undergone a significant number of hours of flight testing with excellent results.

In response to a congressional directive, the FAA has responded with a TCAS-III implementation plan. This plan first intends to upgrade TCAS-II with increased capability. The increased capability includes, among other things, misdistance filtering, which will decrease the number of nuisance warnings inherent in the present TCAS-II equipment design.

We believe that a parallel development and certification of TCAS-III starting concurrently with a program to modify TCAS-II would dramatically decrease the time required to have TCAS-III ready for airline implementation. While its full development and certification may be behind TCAS-II, we are confident that if the

FAA afford the proper priority and leadership, TCAS-III could be ready for operational testing before the end of 1988.

The only problem we envision in this process is the FAA's reluctance to ask for the funding necessary to complete an operational evaluation program for TCAS-III similar to that being conducted for TCAS-II. Without such a program, certification of the TCAS-III will unnecessarily drag on, fulfilling the pessimistic predictions of those who are satisfied with TCAS-II and willing to provide the traveling public with a second rate collision avoidance system.

Next generation radar, NEXRAD, on the terminal doppler weather radar system. NEXRAD fulfills only part of the urgent needs of the aviation user. As a necessary adjunct to the NEXRAD program, we strongly support the application of NEXRAD technology to airport wind shear problems, to the development of a terminal doppler weather radar. It is the best and most direct way to apply the NEXRAD technologies to the problems of severe weather in an airport environment.

We are deeply concerned, however, that the specifications for the terminal doppler weather radar system have not yet been developed by the FAA and provided to industry for comment. Considering the work that has already gone into the program in doppler technique, we find it difficult to understand why these specifications have not yet been finalized.

In addition to a dynamic terminal doppler weather radar program, we believe it is essential that concurrent funding be made available for an equally aggressive research, development and evaluation of an airborne sensor capable of reliably detecting the various forms of wind shear and other severe weather immediately ahead of an aircraft. Many promising studies are currently under way on airborne sensors such as infrared sensors, laser doppler techniques and airborne dopplers.

Since many wind shear encounters are accompanied by very heavy rain, which is thought to have a debilitating effect on wing lift and therefore aircraft performance, we recommend that the FAA examine the impact that heavy rain has on aircraft performance.

Human performance research. In order to help assure safety in our nation's aviation system, it is important to understand the areas where human shortcomings may lead to problems, incidents or accidents. The FAA published a cockpit human factors plan in January 1985 that is designed to investigate human interface with an automated air traffic control system and highly automated new aircraft.

The original funding levels for this important research program were expected to be $1.65 million in fiscal year 1985, $4.3 million in fiscal year 1986, and $3.4 million in fiscal year 1987. Funding levels to date have been just a small fraction, $800,000, of these original projections.

It is a program long overdue, and we urge you, Mr. Chairman, to assist in the allocation of adequate funds and personnel so that the FAA can properly address these critical safety issues.

Runway friction measurement. At the present time, a pilot landing or taking off on a runway contaminated with snow, ice or slush must rely primarily on other pilot reports as to the condition of

that runway and the ability to stop on that runway. These pilot braking action reports are very subjective because the reporting aircraft could be a different model, lighter, heavier, faster, slower.

Therefore, there is a need to determine if the presently available friction-measuring vehicles are sufficiently accurate under winter contaminating conditions to be used to give runway friction measurement information to a flight crew. These vehicles have proven themselves to be very useful to the FAA and airport operator in assuring that the runway is maintained to a satisfactory dry/wet level of friction. We must now expand this knowledge to determine the vehicle's reliability under winter conditions.

Transition to the microwave landing system, MLS. Additional research and development is required for the MLS program. The FAA has yet to determine how and when the MLS receiver will transition from the front azimuth signal to the back azimuth signal doing missed approach procedures and how the appropriate back or front azimuth will be selected for departures.

Also, cockpit displays for complex MLS, segment and encurved approaches have yet to be developed, and the necessary displays for pilot situation awareness have not, as yet, been identified. In addition, there is a need to research and test the multiple MLS antenna locations that will be needed for large aircraft.

In the area of MLS and MLS auto-nav instrument approach procedures development, a substantial amount of research and testing still must be done to develop the required obstacle clearance areas for the various segments and maneuvers.

Airport research and development needs. We urge this subcommittee and Congress to give immediate attention to the research and development needs for airport capacity enhancement. The report of the industry task force on airport capacity improvement and delay reduction identifies many RE&D projects which are essentially for short and long-term capacity improvements. It is critically important that funding be provided for those projects in order to ensure that airport capacity keeps pace with air space capacity.

The prevention of runway incursions is an area that requires additional research and development. Both NASA and the NTSB have identified the need for improved visual aids such as signs and taxi lighting systems to help prevent runway incursions and allow safe operation in low visibility conditions.

The National Airspace System Plan. Mr. Chairman, ALPA has been a strong supporter of the NAS Plan since its inception and continues that support today. We are concerned, as is the entire industry, about the delays, slippages and inadequate funding that have plagued many of the safety-oriented programs in the NASP.

It seems as though the FAA is always able to find some plausible excuse for each delay, be it technological or financial. However, we cannot recall questionable management practices ever being listed as the most probable cause. If this performance continues, we certainly expect more near mid-air collisions, increased delays, and a greater burden on an already overloaded, young and inexperienced controller work force.

We are hopeful that such a scenario will not develop and we can instead look forward to accelerated progress in reaching the goals contained in the plan.

We believe that the NAS Plan in concert with an aggressive airport expansion program can provide both an increased level of system safety and productivity and can mitigate some of the problems we are now encountering. Further, we are encouraged by the administration's current budget request for funding support.

We strongly urge Congress to provide the funds requested and to continue to use the trust fund for the purpose it was intended, the continued development of the world's finest airport and air traffic control system.

Many of the programs I have listed are either jointly under way with NASA or will require the special expertise and facilities available only through that organization. There are many advantages of joint interagency agreements besides not having to duplicate personnel and equipment.

NASA serves as a third party to the FAA and industry and can provide a specialized, unbiased view, which usually results in the consideration of the technical and scientific aspects as well as the operating requirements for a product. The Association fully supports this method of problem solving and commends the subcommittee for promoting and supporting these agreements.

In summary, Mr. Chairman, the FAA's plan for research, engineering and development has never been more important in view of the current status and future growth expectations of the aviation industry. Congress has in the past and will in the future be asked to provide the necessary guidance and funds to carry out such programs.

We have pointed out several areas where we feel special consideration should be given so that the National Airspace System can operate as safely and efficiently as possible.

Mr. Chairman, this concludes my testimony, and we have provided justification for these and other projects in greater detail in our prepared statement for the record. When the time comes, I will be happy to respond to any questions.

Thank you, sir.

[The prepared statement of Mr. Louis McNair follows:]

STATEMENT OF

CAPTAIN LOUIS M. MCNAIR

EXECUTIVE CENTRAL AIR SAFETY CHAIRMAN

AIR LINE PILOTS ASSOCIATION

BEFORE THE

SUBCOMMITTEE ON TRANSPORTATION, AVIATION AND MATERIALS

COMMITTEE ON SCIENCE, SPACE AND TECHNOLOGY

U. S. HOUSE OF REPRESENTATIVES

MARCH 24, 1987

FEDERAL AVIATION ADMINISTRATION

RESEARCH, ENGINEERING AND DEVELOPMENT PROGRAM

Mr. Chairman and members of the subcommittee, I am Captain Louis M. McNair, Executive Central Air Safety Chairman of the Air Line Pilots Association. ALPA represents 39,000 professional pilots who fly for 48 commercial airlines. Accompanying me today is John O'Brien, Director of the Association's Engineering and Air Safety Department. ALPA appreciates this opportunity to appear before you today to add the voice of our membership to others from the aviation community in strong support of the FAA's Research, Engineering, and Development Program.

At the outset, I want to especially commend you, Mr. Chairman, for your leadership in Congress on aviation issues. Your prompt

scheduling of these hearings is clear evidence that you and your subcommittee place the highest priority on critical aviation programs. We all agree that continued research and development in aviation is essential to sustain the operational capability of our air transportation system, provide the improvements necessary to meet additional airport capacity requirements, and provide necessary safety improvements to the nation's air transportation system.

On March 5th, we testified before the House Subcommittee on Aviation regarding the FAA National Airspace System Plan (NASP). Since your subcommittee is also interested in this document, we have attached a copy of that testimony for the record.

For a number of reasons, the FAA has not been provided with sufficient resources necessary to carry out its basic safety mandate. The inadequate funding has forced them to establish program priorities that we believe have not in all cases been in the best public interest from a safety standpoint. We therefore welcome the opportunity to present our comments on those programs which we feel are in need of continued congressional support.

The majority of today's safety or modernization programs will extend over a period of five or ten years or even longer. This is due to the revolution in technology which has produced a complex and extremely sophisticated number of systems to contend

with in any large development program. In most cases, a program of five years' duration is a short-term program. In order to be successful, the FAA must have a sound funding base to provide the necessary resources (personnel, facilities, and equipment) to complete a program on time. Time is important since we are dealing with safety. Time is also important because, in most cases, costs increase with time delays.

The following is a list of research and development programs, projects, or activities which need either funding, direction, legislation, or some combination thereof. Since these programs are all safety related, they should be given special consideration.

1. Traffic Alert and Collision Avoidance System (TCAS)

As you are aware, Mr. Chairman, the FAA and aviation industry over the last six years has actively been in the process of developing an independent airborne collision avoidance system. This system, called TCAS, has several versions, one of which (TCAS II) is now actively flying in line operations in a Piedmont B-727 aircraft. This is a milestone, and we applaud the accomplishments of the people involved in bringing this system to fruition.

We cannot, however, endorse TCAS II as an end product. In our opinion, the TCAS II operational deficiencies of excessive false alarms and vertical-only escape maneuvers eliminate it as a candidate for the air carrier collision avoidance standard. I am sure, Mr. Chairman, you are aware that the FAA and industry has also been working on the development of a TCAS III. As a matter of fact, this system, which is installed on FAA Technical Center aircraft, has undergone a significant number of hours of flight testing with excellent results. While its full development and certification may be behind TCAS II, we are confident that if the FAA affords the proper priority and leadership, the TCAS III could be ready for operational testing before the end of 1988.

The only problem we envision in this process is the FAA's reluctance to ask for the funding necessary to complete an operational evaluation program similar to that being conducted for TCAS II. Without such a program, certification of the TCAS III will unnecessarily drag on, fulfilling the pessimistic predictions of those who are satisfied with TCAS II and willing to provide the traveling public with a second-rate collision avoidance system.

We strongly urge Congress to provide the funding necessary to complete the certification of the TCAS III system and direct the FAA to use it for that purpose.

2. Next Generation Radar (NEXRAD) and the Terminal Doppler Weather Radar System

As pilots, we are greatly concerned with severe weather and, in particular, windshear because we are confronted with its direct effects in the performance of our duties. Although we take professional pride in our training and our ability to master the many types of difficult situations that might confront us, our professionalism demands a healthy respect for the dangers that severe weather holds for the aircraft we fly and the passengers we carry.

We are hopeful that the NEXRAD system currently undergoing evaluation will provide both pilots and controllers with the information necessary to prevent an aircraft from encountering severe weather. We are encouraged by the progress of the NEXRAD program and are hopeful that a contract award will take place by fall of this year.

Yet with all its promise, NEXRAD fulfills only part of the urgent needs of the aviation user. It will certainly be able to generate excellent weather information for enroute

planning, but if we hope to use this technology to detect windshears and microbursts, it must also be able to perform in a terminal airport environment where these phenomena are the most dangerous to aircraft. Because of such issues as siting, resolution, and processing time, the only practical application of this technology for this purpose is the Terminal Doppler Weather Radar System. We strongly support such a system as a necessary adjunct to the NEXRAD program.

We are deeply concerned, however, that the specifications for the Terminal Doppler Weather Radar System have not yet been developed by the FAA and provided to industry for comment. Considering the work that has already gone into the NEXRAD program and Doppler technique, we find it difficult to understand why these specifications have not yet been finalized. This is further evidence that the FAA needs to assign priorities and must recognize that safety-related programs have to come first!

In addition to a dynamic terminal Doppler weather program, we believe it is essential that concurrent funding be made available for an equally aggressive research, development, and evaluation of an airborne sensor capable of reliably detecting the various forms of windshear and other severe weather immediately ahead of an aircraft. This would provide pilots with state-of-the-art weather detection

wherever they fly, would not limit the application of such technologies to a select number of airports within our national airspace system, and would provide the aviation public with the maximum degree of protection from future tragedies such as Delta 191 in Dallas. Many promising studies are currently under way on airborne sensors such as infrared sensors, laser-Doppler techniques, and airborne Dopplers.

Since many windshear encounters are accompanied by very heavy rain, which is thought to have a debilitating effect on wing lift and, therefore, aircraft performance, we recommend that the FAA also examine the impact that heavy rain has on aircraft performance.

3. Human Performance Research

In order to help ensure safety in our nation's aviation system, it is important to understand areas where human shortcomings may lead to problems, incidents, or accidents. The FAA is attempting to address these issues through selection, hiring, and operational practices for its employees. Pilots are the other half of the important safety equation.

The FAA published a Cockpit Human Factors Research Plan in January 1985 that is designed to investigate and improve the human interface with an automated air traffic control system and highly automated new aircraft. The FAA has begun to address several operational safety issues identified by this plan, and more will be studied at a later date.

Rather than curtail these important human interaction safety studies, we feel the FAA should proceed with its plan with increased vigor and commitment. The original funding levels for this important research program were expected to be $1.65 million in fiscal year 1985, $4.3 million in fiscal year 1986, and $3.4 million in fiscal year 1987. Funding levels to date have been a small fraction of these original projections. It is a program long overdue, and we urge you, Mr. Chairman and member of your subcommittee, to allocate adequate funds and personnel so that the FAA can properly address these safety issues. The findings of these safety studies will yield important immediate operational safety gains and continue to pay safety dividends in the future.

4. Runway Friction Measurement

At the present time a pilot landing or taking off on a runway contaminated with snow, ice, or slush must rely primarily on other pilot reports as to the condition of that

runway and the ability to stop on that runway. These pilot braking action reports are very subjective because the reporting aircraft could be a different model - lighter/heavier, faster/slower, etc. There have been many instances in which aircraft went off runways because the flight crew had inadequate information on the stopping condition of the runway. Therefore, there is a need to determine if the presently available friction measurement vehicles are sufficiently accurate under winter contaminated conditions to be used to give runway friction measurement information to a flight crew. These vehicles have proven themselves to be very useful to the FAA and an airport operator in ensuring that the runway is maintained to a satisfactory dry/wet level of friction. We must now expand this knowledge to determine the vehicles' reliability under winter conditions. Such a research and development program is approximately 50 percent complete. Since this program involves both ground vehicles and large transport aircraft (B-727 and B-737), Congress should either earmark or recommend $500,000 to be spent each year, for the next four years, in order to complete this project.

5. FAA Security Program

Although airports already have elaborate systems for searching passengers and luggage to minimize the chances of

a hijacking, hijacking incidents still occur and terrorism is continuing to spread worldwide. Recent terrorist activities have emphasized that our security systems are still vulnerable.

To counter this threat, we must continue the FAA security program and make improvements. As the terrorists increase their knowledge, techniques, and sophistication, we need to update and improve our security efforts. Since terrorists continue to modify both the packaging and types of weapons and explosives they use, there is a continuing need to develop new technology that will detect these threat sources. Furthermore, there is a need to increase the number of security inspectors and to purchase additional and more sophisticated detection systems as they become available. It is estimated that at least $10 million is necessary for this addition.

6. Transition to the Microwave Landing System (MLS)

ALPA supports the MLS program because precision approach procedures are inherently safer than nonprecision approaches. We also support prompt installation of ILS systems where they can be installed. Our position has long been that there should be a precision approach to every runway used by air carrier aircraft. We are concerned that

many runways identified for a precision system will have to wait several years for an MLS.

The flexibility of the MLS, especially regarding siting and installation costs, makes it possible to have a precision approach to runways where an ILS is not feasible. Also, the FAA has revised its Airway Planning Standard Number One to include MLS qualifying criteria that will permit MLS selection for runways that could not have qualified using the present ILS criteria.

Because of its direct relation to safety, the ILS and MLS programs should not be subjected to any budget reduction that would delay the availability and installation of precision approach guidance for additional runways.

The success of the MLS implementation plan depends greatly on the will of the users to purchase MLS receivers. Implementation will be seriously handicapped if the FAA proceeds with its plan to collocate the MLS with ILS systems. Congress should direct the FAA to ensure that, in the near term, MLS systems be installed primarily on runways that will increase airport capacity or on runways that do not now have a precision approach system.

Additional research and development is required for the MLS program. The FAA has yet to determine how and when the MLS receiver will transition from the front azimuth signal to the back azimuth signal during missed approach procedures and how the appropriate (back or front) azimuth will be selected for departures.

Also, cockpit displays for complex MLS/RNAV segmented and curved approaches have yet to be developed, and the necessary displays for pilot situation awareness have not as yet been identified. In addition, there is a need to research and test the multiple MLS antenna locations that will be needed for large aircraft.

In the areas of MLS and MLS/RNAV instrument approach procedures development, a substantial amount of research and testing still must be done to develop the required obstacle clearance areas for the various segments and maneuvers.

7. Airport Surface Detection Radar (ASDE)

The problem of "close encounters of the wrong kind" on airport surfaces is one growing in magnitude. One need only examine the accident and incident reports for the past ten years to see the continuous increase in events involving either two aircraft or an aircraft and vehicle.

The worst collision in aviation history occurred on the ground between two B-747 air carriers at Tenerife. The increasing number of unauthorized runway incursions should be a signal that this matter needs attention before even more disasters occur. Currently the only tool air traffic controllers have available at a limited number of airports to deal with this problem is an antiquated, unreliable radar system that, from what we have been told, is virtually worthless. The FAA has, for the last decade at least, been in the process of developing and procuring a new-generation surface detection radar (ASDE III) that would provide controllers the display they need to ensure adequate separation between aircraft during periods of poor visibility. Needless to say, this has not been one of the better managed FAA programs!

We understand that a contract has finally been awarded to procure approximately 30 of these new systems to replace the current ones and for installation at new sites. We welcome this action and hope they will be installed and operational so as to keep pace with the tremendous growth of traffic activity at our major airports. But perhaps we should not stop with the procurement of these units. The American taxpayer has expended an enormous amount of money for the Department of Defense to develop sensors that can see in the

dark or through obscurations to vision. Can this technology be adapted for use on airport surfaces so that controllers can see through bad weather and darkness? The safety implications would be interesting to explore, and we feel sure there are American manufacturers out there who would be delighted to provide both the FAA and members of your subcommittee information on their equipment capabilities. We believe this is a concept that the FAA should actively pursue through an active R,E&D program. We would also hope your subcommittee would find it equally interesting.

8. Aircraft Certification Standards for New Technology Aircraft

Present regulations dealing with the certification of air carrier aircraft do not address some of the systems and concepts being proposed for the next generation of aircraft. Systems such as fly-by-wire, fly-by-light, active controls, reduced static stability, side stick-control and associated new cockpit instrumentation, where the aircraft to a greater or lesser extent is being controlled by computers, have appeared only on certain military aircraft where mission requirements dictated such systems. In many cases these automatic systems are still in the military research and development area. However, several manufacturers are proposing that these exotic systems be standard on air carrier aircraft scheduled to be flown and certificated

within the next two to three years. It is already known that these sophisticated systems are more susceptible to electromagnetic interference (EMI) and lightning strikes than conventional control systems. What isn't known is how to protect these computer-controlled systems from total failure following a lightning strike or interference by some other high energy source. At the present time, the expertise in these fields is at the industry level, not at the regulatory level. Therefore, the FAA is dependent upon the system manufacturer for certification guidance, which is a very questionable role reversal.

Therefore, if the FAA and the certification regulations addressing such systems are to keep pace with these advancements, it is imperative that funding be approved to allow FAA personnel to investigate these systems and concepts.

9. Cabin Safety

The topic of air carrier cabin safety encompasses a very large range of items and includes carry-on baggage, interior crashworthiness, and interior fire resistance. We recognize and congratulate both the FAA and industry for the amount of R,E&D already completed in this area. However, to a great extent, this R,E&D has only proven how little we now know

about cabin interior smoke, fire, and toxicity, and indicates an obvious need to continue testing. Furthermore, as aircraft manufacturers and airlines continue to add fuel tanks in previously sterile areas such as cargo compartments and tail planes, we must guarantee that this additional fuel will not turn the passenger cabin into an inferno. Research into anti-misting fuel must therefore continue into fuel tank design, such as self-sealing tanks and breakaway self-sealing fittings. All of these items affect passenger safety and the ability to survive an inflight fire or accident. Improvements in cabin safety, however, have been slow in coming and require additional attention from Congress to ensure the necessary improvements.

10. Cockpit Display of Traffic Information

The Air Line Pilots Association is concerned about the potential role of the Cockpit Display of Traffic Information or Airborne Situation Display (ASD) in the new ATC system. We feel the merits of such a system have been obsured because of exaggerated claims made both by some of its proponents and by those with interests in competing alternatives. These conflicting claims have prevented a positive approach toward developing the concept into a working reality. The original NASP at least briefly addressed the possible merits of ASD, but the current

version does not contain any reference to such a system at all.

The tests of the ASD to date by the FAA and NASA have shown to everyone's satisfaction that substantial capacity gains may be achieved through pilot-controlled spacing on in-trail arrivals and departures using common paths. We recommend that ASD be reinstated as an active R,E&D program.

11. Airport Research and Development Needs

We urge this subcommittee and Congress to give immediate attention to the R,E&D funding needs for airport capacity enhancement. The report of the Industry Task Force on Airport Capacity Improvement and Delay Reduction identifies many R,E&D projects which are essential for short- and long-term capacity improvements. (A copy of the Executive Summary is attached.) It is critically important that funding be provided for those projects in order to ensure that airport capacity keeps pace with airspace capacity.

The prevention of runway incursions requires additional research and development. Both NASA and the NTSB have identified the need for improved visual aids such as signs and taxiway lighting systems to help prevent runway incursions and allow safe operations in low-visibility

conditions. Visual glidepath guidance is also an essential ingredient for safe operations during construction projects involving threshold displacement. There is currently no means to provide such guidance information. A means needs to be developed for effective temporary visual and electronic vertical guidance systems. Additionally, there is a need to develop effective lighting and marking of airport surfaces specifically for use during construction projects.

In addition, there is a need for an overall integrated system that will prevent runway incursions by aircraft and ground vehicles on an airport. The Surface Movement Guidance and Control System (SMGCS) has been introduced as a possible solution to the problem of incursions; however, additional research and development is needed before this or any similar system can become operational.

Many of the programs listed above are either jointly under way with NASA or will require the special expertise and facilities available only through that organization. There are many advantages of joint interagency agreements besides not having to duplicate personnel and equipment. NASA serves as a third party to the FAA and industry, and can provide a specialized, unbiased view. This usually results in the consideration of the technical and scientific aspects as well as the operating requirements for

a product. The Association fully supports this method of problem solving and commends the subcommittee for promoting and supporting these agreements.

In summary, Mr. Chairman, the FAA's plan for research, engineering, and development has never been more important in view of the current status and future growth expectations of the aviation industry. Congress has in the past and will in the future be asked to provide the necessary guidance and funds to carry out these programs. We have pointed out several areas where we feel special consideration should be given so that the national airspace system can operate as safely and efficiently as possible.

INDUSTRY TASK FORCE

ON

AIRPORT CAPACITY IMPROVEMENT AND DELAY REDUCTION

September 29, 1982

EXECUTIVE SUMMARY

OF MAJOR RECOMMENDATIONS

TO THE FEDERAL AVIATION ADMINISTRATION

Wake Vortex Improvements (Report, p. 3)

- Expedite Vortex Advisory System (VAS) test program at Chicago.
- Early reclassification of all aircraft based on realistic criteria which accurately reflect wake vortex characteristics.
- Promptly reclassify all DC-8 and B-707 aircraft from "heavy" to "large" for landing.
- Consider classifying the B-767 as a "large."
- Promptly determine from data available the extent that DC-8 and B-707 takeoff spacings can be reduced.
- Consider eliminating wake vortex restrictions under certain steady cross wind conditions.
- Develop real-time wake vortex sensors for field implementation.

Air Traffic Control Capacity Improvements (Report, p. 4)

- Expedite program to permit safe introduction of independent IFR parallel approaches with runway spacing below 4,300 feet to as low as 3,000 feet.
- Immediately permit the use of dependent IFR parallel approaches with two-mile diagonal spacing between aircraft to parallel runways separated by 2,500.
- Provide for the introduction of converging IFR approaches.
- Expeditiously provide for the introduction of certified IFR converging approaches.
- Provide for independent parallel instrument approaches to triple parallel runways; and dual parallel approaches plus a converging IFR approach.

- Provide for separate short runway use by Category A and B aircraft.
- Finalize research necessary to provide for higher glide slopes for light aircraft.
- Immediately introduce aircraft longitudinal spacing reductions when wake vortex and workload are not a problem.
- Provide for simultaneous IFR approaches with a visual segment at the earliest possible time.
- Undertake testing to provide for reduction in the two-mile diagonal spacing for dependent IFR parallel approaches.

Integrated Flow Management And Associated Concepts (Report, p. 8)

- Within one year deploy the Runway Configuration Management System at Chicago with field testing to be completed within two years.
- Fund the development of the Acceptance Rate Computation System for field demonstration and validation.
- Fund the Departure Flow Metering concept for laboratory demonstration.
- Give high priority to developing improvements for common use of certain airspace sectors by the aircraft using a hub's multiple airports, and to implementing such improvements as they occur.
- MLS deployment should proceed at an orderly pace, with appropriate studies as to how it can best increase airport capacity.
- The on-going development of Integrated Flow Management should be structured so any airspace structural or procedural changes will also facilitate operations by helicopters and commuters.
- FAA R & D to explore, develop and consider providing the necessary data to support Cockpit Display of Traffic Information (CDTI) uses in en-route and terminal air space, as well as in near-and on-airport applications.

Airport Runway/Taxiway Systems (Report, p. 11)

- Allocate sufficient funding to undertake necessary data collection, testing and development to secure solutions to the following concerns:
  - improved runway exit lighting and marking
  - information on runway-taxiway surface conditions
  - exit taxiway locations and geometry
  - other restrictive factors affecting runway occupancy time
- A program definition project for predicting aircraft stopping capability related to runway friction measurement data derived from measurement devices, considering actual airport operational environments, and:
  - needed research on new pavement design and construction to maximize surface traction.
  - needed research on pavement maintenance methods and materials to maintain good surface conditions.

- Undertake an aircraft/airport compatibility study program to:
  - evaluate the limitations of existing airport facilities for corrective funding needs.
  - evaluate relationships between aircraft clearances and safety to identify further reductions in separation requirements.
- Support and undertake a strong comprehensive R&D effort on airport pavement design, maintenance and construction to expedite advanced construction methods and to reduce downtime due to repairs.
- As soon as possible, implement ASDE-3 programs at capacity constrained airports.
- Undertake needed R&D for introduction of appropriate surface movement guidance and control systems.
- Undertake needed development programs to adequately phase in non-interfering helicopter operations.
- Pending introduction of MLS, provide adequate ILS/ALS facilities to assure that runway approaches requiring precision electronic guidance will be equipped for low visibility operations.

Landside Issues (Report, p. 18)

- Give high priority to addressing the noise problem and continuing firm enforcement of the DOT Noise Policy, FAR Part 36, Part 91 and encourage FAR Part 150 activities.
- Support the strongest position possible for Federal preemption of the noise problem and its associated financial liability.
- Strengthen the effectiveness of FAR Part 77 in maintaining operational flight safety areas adjacent to runways free of obstructions.

Institutional/Socio-Economic Issues (Report, p. 18)

- DOD/FAA promptly finalize a procedure for handling requests for joint use of military airports.
- Support local community acquisition and retention of excessed military airports for civil aviation purposes.
- Provide funding (ADAP) to ensure development and retention of reliever airports on a priority ranking basis.
- Issue a definitive policy statement encouraging construction of new airports and expansion of existing airports to meet public needs and aviation's growth.
- Funding for new airport site selection be made a priority.
- Ensure methods to assist in financing future airport land banking.

- Assist in promoting tax relief for public use portions of privately-owned public use airports.

- Consider a National Cooperative Airport Research Program to coordinate, fund and pursue needed research in areas affecting capacity (e.g., airport configurations, pavement strength enhancements, construction methods and materials, runway lighting and markings and maintenance techniques).

- Provide adequate Airport Program staffing and resources in the FAA field and headquarters offices to adequately implement and assure a comprehensive airport capacity improvement program.

Human Factors (Report, p. 23)

- Place high emphasis on the selection of first line controller supervisors and facility managers, and controllers management training programs.

- Waive mandatory retirement age for controllers so they may work part-time during peak periods and perform on-the-job training assignments; and waive maximum controller entrance age so military, commercial pilots, etc., can be made eligible for hiring.

- Qualified controllers should provide input to the design and development of new equipment under consideration for the ATC system of the future.

- Undertake a comprehensive review program to standardize the best and most proven application of ATC procedures, including those which are site specific and found beneficial to increased capacity.

* * *

STATEMENT OF

JACK HOWELL

CHAIRMAN, AIR TRAFFIC CONTROL COMMITTEE

AIR LINE PILOTS ASSOCIATION

BEFORE THE

SUBCOMMITTEE ON AVIATION

COMMITTEE ON PUBLIC WORKS AND TRANSPORTATION

U.S. HOUSE OF REPRESENTATIVES

MARCH 5, 1987

NATIONAL AIRSPACE SYSTEM PLAN

Mr. Chairman and members of the subcommittee, I am Jack Howell, chairman of the Air Line Pilots Association Air Traffic Control Committee. ALPA represents the professional interests of over 39,000 pilots who fly for 47 airlines.

We appreciate the opportunity to appear before you today and to express the association's views on the National Airspace System Plan. Our comments may differ in viewpoint from those presented to you by other members of this industry who will testify on the technical merits of the NAS Plan because they will reflect operational and safety views we feel most qualified to offer. Nevertheless, we hope our comments will help the members of the subcommittee to

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put the concept embraced in the NAS plan into perspective.

At the onset I would like to say that ALPA has been a strong supporter of the plan since its inception, and we continue our support today. We are, of course, concerned, as is the entire industry, about the delays and slippages in the various programs and the inadequate funding support over the past few years. If these trends continue, we certainly expect more near mid-air collisions, increased delays, and a greater burden on an already overloaded young and inexperienced controller work force. We are hopeful that such a scenario will not develop, and we can instead look forward to accelerated progress in reaching the goals contained in the plan.

We are vitally interested in seeing that those elements of the plan which are primarily safety oriented receive priority in the implementation scheme over those designed for capacity enhancements and equipment replacement.

The reason for this is obvious; simply look at the rate that traffic has grown over the past few years and the forecasts for the future. According to recent FAA figures, there were 10.1 million air carrier operations in 1978, the infamous year of deregulation; this number is projected to exceed 15 million in 1995. While contemplating these figures, also consider the steadily increasing number of near mid-air collisions occurring each year and the potential tragedies ahead. Consider also the number of appalling delays that severely inconvenience a significant number of ticket-buying passengers. These delays have reached approximately 2500 hours a day--the equivalent of grounding a major airline's 250 transports for a 24-hour period. The cost associated with this atrocious figure is staggering!

While we do not support one recent initiative to form a federal corporation to operate the ATC system independently from the FAA, we can appreciate the frustration with present conditions and the lack of hope for relief in the near future reflected in the proposal. We do, however, recommend separating the FAA from the Department of Transportation and the removal of the Aviation Trust Fund from the General Fund.

I would like to share with you now the line pilot's view on the operation of the National Airspace System and its apparent direction. In a safety survey of line pilots conducted by ALPA last year, the greatest single concern expressed was of a mid-air collision. The second most important concern was of airport congestion and system overload.

Pilots know that the present ATC system and acceptance rate of our major airports cannot accommodate the ongoing growth of traffic. At times it even appears that the potential for a system breakdown exists. To its credit, however, the FAA has prevented this through the application of flow control procedures and airport quotas, which we support and believe must be maintained until the controller work force is strengthened and critical NAS Plan elements are in place.

In an attempt to compensate for the inability of our current system to accommodate user demands, the FAA is continually exploring ways to increase system capacity. Unfortunately these means frequently include the reduction of various separation standards and the introduction and proliferation of unorthodox procedures. We feel strongly that such procedures reduce the margin of safety and actually contribute to near mid-air collisions and runway incursions--a high price to pay for a minor increase in system capacity.

Frequently we pilots are accused of being either negative or too conservative in our reaction to such proposals, but I would like to remind the subcommittee that federal law places the final responsibility for the safe operation of an air carrier aircraft directly on the shoulders of the captain. Pilots accept this, but we are also aware that following an incident or accident involving any of these procedures and the many variables such as weather, runway contamination, or mechanical problems, no one will step forward and offer to share that responsibility. Therefore, we will continue to act both cautiously and responsibly in accepting any new procedure we believe could compromise the safety of the traveling public.

The operational philosophy of the NAS Plan dictates that the primary responsibility for the separation of air traffic rests with the ground-based ATC system. We have supported this concept for years. However, the FAA has just recently proposed revising the Operational Specifications that govern the operations of all air carriers so that pilots of passenger-carrying aircraft can accept visual approaches at a point 35 miles from the destination airport. The significance of this is that when a pilot accepts such an approach, which may be initiated by ATC, the ground control system is absolved of all responsibility for the separation of that aircraft from others, and air traffic control reverts to the "see-and-avoid" system. According to the FAA near mid-air collision statistics, approximately 80 percent occur within 35 miles from an airport. The use of visual separation at such distances by ATC to expedite terminal area operations and to increase the number of aircraft that can operate to and from airports conflicts with the NAS Plan concept; it transfers the responsibility for separation to the cockpit at a time when both pilot workload and the potential for a mid-air collision are at their highest levels.

ALPA has been a leading advocate for the development and installation of an effective airborne collision avoidance system and a cockpit display of traffic information that would both prevent the collision of air carriers and provide pilots with a situation awareness of surrounding traffic. The NAS Plan includes a requirement for a collision avoidance system, and we are encouraged by the FAA's recent position on mandating a TCAS for air carriers. However, we are concerned that it will not be the best system available. We are also concerned about funding for the operational testing of the TCAS III. Such support is absolutely necessary to ensure the timely certification and availability of this system, which, in our opinion, is the only one suitable in the long term for air carrier operations. As for a cockpit display of traffic information, apparently the FAA bureaucracy thought it conflicted with their policy for providing all separation from the ground-based ATC system and deleted it from follow-on versions of the original NAS Plan. We believe it's time to restore the CDTI concept to the R&D efforts supporting the NAS Plan because of its capabilities for safely and efficiently accommodating the future growth of traffic.

Mr. Chairman, I have tried to provide you an idea of ATC system operations from a pilot's viewpoint. We believe that the NAS plan in concert with an aggressive airport expansion program can provide both an increased level of system safety and productivity and can mitigate some of the problems I have just described. Further, we are encouraged by the Administration's current budget request for funding support. We strongly urge Congress to provide the funds requested and to continue to use the trust fund for the purpose it was intended--the continued development of the world's finest airport and air traffic control system.

This concludes my prepared remarks. I would be pleased to answer any questions you may have.

Mr. MCCURDY. Thank you, Captain McNair, for a very good statement and very detailed. We look forward to going into greater detail in a few minutes.

Ms. Matthews.

STATEMENT OF SUZETTE MATTHEWS, GENERAL COUNSEL, AIR TRAFFIC CONTROL ASSOCIATION, ACCOMPANIED BY LAWRENCE C. FORTIER, JR., CHAIR-ELECT, AIR TRAFFIC CONTROL ASSOCIATION

Ms. MATTHEWS. Mr. Chairman, members of the subcommittee, the Air Traffic Control Association is a professional association of 30 years' standing, which has as its goal advancements in the science and profession of air traffic control and aviation safety.

ATCA's membership consists of air traffic controllers, maintenance technicians, managers, pilots, corporations and organizations engaged in the development, maintenance and use of our National Airspace System.

I am pleased to have with me today Mr. Lawrence C. Fortier, Jr. Mr. Fortier is our Chair-Elect. He is a past president of ATCA and a former FAA employee.

ATCA appears before you today to present its views on the Administration's proposed reauthorization legislation, the Airport and Airway Enhancement Act of 1987, funding levels for FAA being proposed by the Administration, and progress of the NAS Plan.

ATCA applauds the subcommittee's effort to proceed rapidly with reauthorization of our Nation's airport and airway programs before expiration of the current law, the Airport and Airway Improvement Act of 1982. However, ATCA urges the subcommittee to support and approve legislation of five years duration, rather than the two-year bill proposed by the Department of Transportation.

Long-range financial planning is essential for grant applicants in the airport improvement program, to keep NAS Plan projects proceeding on schedule, and to attract and maintain the best of industry support and participation. If adjustments to any programs become necessary, either as a result of experience or in response to recommendations of the Aviation Safety Commission, the Congress can amend the reauthorizing legislation.

ATCA recommends the following funding levels for FAA capital improvement and airport improvement programs. For FAA facilities and equipment, ATCA recommends $1.6 billion in fiscal years 1988 and 1989, $1.5 billion in fiscal year 1990, and $1.4 billion in fiscal years 1991 and 1992. These amounts are in keeping with FAA's own 1986 revised projections of financial need in order to keep the NAS Plan on schedule.

In particular, ATCA urges Congress to authorize sufficient funding to permit FAA to return to full funding of those essential projects, including NEXRAD, which have been forced into year-by-year appropriations.

For FAA research, engineering and development, ATCA recommends at least $200 million to $225 million per year for the next five years. This is the minimum amount required to assure consistent NAS planning, and to assure timely availability of products

necessary to maximize productivity associated with completion of the NAS Plan.

Generally speaking, RE&D and funding is allocated approximately 40 percent to projects which directly support the NAS Plan, 12 percent to regulation and safety improvements, 5 percent to necessary improvements to NAS systems over time, which is called "sustaining engineering", 40 percent to NAS Plan enhancements—for example, AERA 3 and the Advanced Traffic Management System—and 3 percent to advanced concepts such as satellite technology and study and analysis.

Since the first three categories of RE&D funding are critical to daily operations and NAS Plan progress, any substantial reduction in RE&D funding will cause interruption in research and development of NAS Plan enhancements. These funds, however, are particularly critical because it is precisely those technological developments which have the greatest capability to increase capacity in the ATC system.

For the Airports Improvement Program, we recommend at least $1.8 billion per year in fiscal years 1988 through 1993. With over $24 billion of AIP-eligible projects identified in the National Plan of Integrated Airport Systems—which is called the NPIAS for short—for the period 1986 to 1995, and more than $3 billion in unfunded grant applications outstanding, it is clear that opportunities for improvements to the NAS are going unrealized at the current and proposed funding levels of $1 billion per year.

ATCA therefore endorses the AIP funding level being recommended jointly by the American Association of Airport Executives and the Airport Operators Council International. ATCA recommends that the airport and airways reauthorization legislation include a provision such as that contained in H.R. 8, removing the Airport and Airway Trust Fund off the unified Federal budget.

Although funding for FAA capital improvement programs and projects will continue to be subject to Congressional oversight in the annual appropriations process, moving the Trust Fund off budget would encourage spending by eliminating the incentive to let Trust Fund balances mount up in order to artificially diminish the appearance of the Federal deficit.

ATCA recommends that the airport and airways reauthorization legislation retain the penalty clause in current law, which diminishes the allowable Trust Fund contribution to FAA's Operations account if Trust Fund expenditures for capital improvements fall below authorized levels.

Low level appropriations to FAA capital improvement accounts during the past five years, and that is to the point of forcing FAA to remove some projects from full funding, clearly indicate that some mechanism is required to encourage spending from the Trust Fund. To ATCA's knowledge, no more effective device than the current one has been suggested. Moreover, it is far from clear that the current system has been completely ineffective. It is possible that even fewer Trust Fund dollars would have been appropriated for capital improvements over the past five years had the penalty clause not existed.

ATCA does not, on the other hand, recommend adoption of a trigger mechanism to suspend collection of ticket, waybill and fuel

taxes when the Trust Fund balances exceed a specified level. A trigger mechanism would not necessarily encourage capital improvement expenditures, and if activated, could have the disastrous consequence of causing a deficit in the fund in the year subsequent. This could result in a drastic delay or even interruption in FAA capital improvement projects, a result to be avoided at all costs.

ATCA opposes that aspect of the administration's proposal which would increase the permissible percentage of total FAA expenditures which could be recovered from the Trust Fund to 85 percent. This percentage is based upon the assumption that direct users of the NASP should pay all costs of the system except for the 15 percent directly attributable to military and public aircraft usage.

Such reasoning presumes that direct users are the sole beneficiaries of our National Airspace System. The entire American population, however, even those individuals who never actually themselves fly or ship by air, desire and benefit from the availability of the National Airspace System to accommodate their needs.

Certainly the general fund should continue to contribute substantially toward maintenance and improvement of the airways which are so essential to the commerce, defense and general welfare of our society as a whole.

With regard to the Airport Improvement Program, ATCA respectfully urges Congress to elaborate somewhat upon the administration's salutary proposal to formulate an airport report on operating characteristics and future needs of the National System of Airports. Although obvious planning benefits can be derived from a well-documented report setting performance specifications for the NASP, care must be taken that the report not become an opportunity to eviscerate the compendium of airport improvement opportunities now in the National Plan of Integrated Airport Systems.

ATCA therefore recommends that if Congress decides to adopt the Department's proposal, the reauthorization legislation specify that those projects already identified in the NPIAS be included in, and form the basis for, the report.

ATCA does not favor that aspect of the Administration's reauthorization proposal which proposes voluntary defederalization of airports, that is, voluntary withdrawal from eligibility for airport improvement grants in exchange for the opportunity to impose a passenger facility charge upon those using the airport.

The integrated coast-to-coast network of airports and airways which exists today facilitates efficiency through Federal planning and coordination of airport improvement resources, and convenience for the passenger through national uniformity in airline ticketing and interlining.

ATCA fears that voluntary defederalization jeopardizes and detracts from our common goal of maintaining and enhancing the National Air Transport System by opening the door to Balkanization. Moreover, although the Administration's proposal to permit airport sponsors to withdraw from the Federal grant program would not relieve airlines, passengers and shippers using that facility from payment of those ticket, waybill, and aircraft fuel taxes which fund the Airport and Airway Trust Fund, ATCA fears that exemption from Federal user fees eventually will be requested by those airports which do defederalize.

Since the Trust Fund pays for capital improvements to the NAS, users operating through a defederalized airport rightfully should continue to contribute to the fund.

The Administration's proposal to permit the states to administer block grants of AIP funds gives due recognition to the capability and willingness of many states to assume an active role with FAA in support of aviation programs. For the reasons stated earlier in connection with defederalization, however, ATCA does not support state block grants of AIP funding.

ATCA believes that airport planning on the Federal level best promotes efficiency and economy in the National Air Transport System.

In closing, ATCA urges the subcommittee to assure that FAA has available to it funding authorization and appropriation sufficient to get on with the business of completing the NAS Plan. Today more than ever, technologies are being made available for upgrading our National Airspace System to cope with tremendous and ever-increasing demands placed upon it.

FAA's National Airspace System Plan provides a sound opportunity for systematic improvement. Daily the NAS Plan is being subjected to reevaluation and potentially killing scrutiny. Will we dissect and examine modernization programs until funding becomes exhausted or diverted to other needs without realizing the true potential of our ATC system? Delay and indecision can have that result. This would be a sad but conceivable conclusion.

Automation is our future. It is overdue. It can provide new capacity. It is the essence of productivity. No one questions that delays plague our ATC system, particularly at peak hours at our busiest airports and in bad weather. Often the current size of our controller work force is erroneously blamed for delays when the real culprit is too much traffic for an outdated ATC system and inadequate groundside facilities.

Let us recognize that our controller workforce is doing the best possible job with an overworked, aging, largely manual system which at times cannot cope with the demands of today's air transportation marketplace. We need to get on with NAS modernization and provide our controllers with the best tools that today's technology has to offer.

Thank you for the opportunity to present these views. We will be happy to answer any questions you have.

Mr. McCURDY. Thank you, Ms. Matthews, Mr. Fortier.

Mr. Power?

STATEMENT OF WILLIAM H. POWER, VICE PRESIDENT, GOVERNMENT AFFAIRS, NATIONAL AIR TRANSPORTATION ASSOCIATION

Mr. POWER. Thank you, Mr. Chairman.

The other witnesses today have done a very good job, I think, in discussing some of the more technical aspects of the NAS Plan and FAA's research functions, so instead, NATA would like to offer one very brief but what we feel very important point for your consideration, and that is simply that the aviation consumers today are very cynical about the reauthorization process and we find there is

a ground swell building demanding that their tax dollars be spent for the purposes to which they are dedicated.

The National Air Transportation Association represents fixed base operators. FBOs are located at virtually every airport across the country, from the smallest field to the largest air carrier airport. They make their money—they make their profits by providing a number of services to the aviation community, the most profitable which are the sale of aviation fuel, maintenance of aircraft and the chartering of aircraft.

FBOs typically sell fuel to the widest spectrum of aircraft, from the smallest single engine airplane used in flight instruction to the largest business jet. Many of our members are in fact involved in contract fueling for airlines.

We offer this to you because we think it is important for you to realize that FBOs perhaps better than any other segment of the aviation industry are in the perfect position to be a real time barometer of what is going on in the aviation community these days.

We are finding almost on a daily basis that our members are telling us that their customers don't trust the Administration and they really don't trust the Congress to make the necessary protections a part of this reauthorization legislation and they want those protections.

We realize that this may be somewhat outside the scope of this hearing but we feel it is very important for you to understand the way the aviation community is feeling these days and perhaps to suggest that you keep that in the back of your minds as you are deliberating on some of the more technical aspects of the reauthorization.

Thank you very much.

[The prepared statement of Mr. William H. Power follows:]

NATIONAL AIR TRANSPORTATION ASSOCIATION
4226 King Street • Alexandria, Virginia 22302 • (703) 845-9000

Founded
December 28, 1940

Statement of the

NATIONAL AIR TRANSPORTATION ASSOCIATION

Before the

SUBCOMMITTEE ON TRANSPORTATION, AVIATION
AND MATERIALS

of the

COMMITTEE ON SCIENCE, SPACE AND TECHNOLOGY

U.S. HOUSE OF REPRESENTATIVES

on the

REAUTHORIZATION OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982

MARCH 24, 1987

Representing Commercial Aviation Service and Transportation Companies

Mr. Chairman and Members of the Subcommittee, I am William H. Power, Vice President of Government Affairs of the National Air Transportation Association. NATA represents the business interests of fixed base and air taxi operators at over 1200 locations throughout the United States.

Fixed Base Operators, or FBOs as they are known, are perhaps the most complicated type of business in aviation today. Most FBOs are involved in a variety of aeronautical activities: sale of aviation fuel to private and business aircraft; airline refueling; aircraft parking and hangaring; repair and maintenance of aircraft; aircraft sales; flight instruction; and aircraft charter to name just a few. Even though most of our Members provide all of these services, the major profit centers for virtually all fixed base operators are the sale of aviation gasoline and jet fuel, maintenance, and the chartering of their aircraft.

FBOs and air taxis are located on airports all across the country -- from the smallest general aviation field to the largest air carrier airport. These companies are not only concerned about airport and airway development from a philosophical standpoint, they are an integral part of the process, since they act as collection agents for the U.S. government. Each time an FBO sells a gallon of avgas or jet fuel, it is required by law to collect the federal aviation excise tax on that sale. Each time an air taxi provides its aircraft to a charter customer, that air taxi must collect the federal passenger ticket tax. Of course, these taxes are deposited in the Aviation

Trust Fund for use in airport and airspace development.

The Subcommittee should understand the very unique position that fixed base and air taxi operators occupy with regard to airport and airway reauthorization. Since these companies are so geographically diverse, they are concerned with development at **all** airports. Not just general aviation fields and not just air carrier airports. Since one of their major sources of revenues is from fueling all types of aircraft -- private, business and airline -- they are very aware and supportive of the interests of those segments of aviation. Since air taxis operate in the entire airspace system, they are vitally concerned with all aspects of its development.

As much as any other segment of aviation, fixed base and air taxi operators are concerned about total aviation system development. Not just large airports. Not just small airports. Not just Terminal Control Areas or unrestricted airspace, but the **entire** aviation system.

This, coupled with the fact that FBOs and air taxis serve virtually all segments of the aviation industry, requires NATA to look at reauthorization from the macro sense. We encourage the Subcommittee to seriously consider the specific issues raised by other witnesses concerning FAA's research efforts. Likewise, we are intentionally leaving specific, technical discussions about the National Airspace System Plan to those witnesses with specific expertise in those areas.

Instead, NATA will limit its remarks to our Members' overall concerns about airport and airways funding.

In early 1982, when Congress was contemplating the last reauthorization of this program, NATA expressed, for the record, a number of concerns. Primary among them was a growing surplus in the Aviation Trust Fund and the Administration's efforts to use the Trust Fund to pay for more of the Federal Aviation Administration's operations and maintenance budget.

In spite of those concerns, NATA Members reluctantly agreed to support an increase in aviation user fees for two reasons: (1) the realization of the need for implementation of the NAS Plan, and (2) Administration officials repeatedly offered assurances that the Trust Fund would actually be spent for capital improvement and not held "hostage" to help balance the nation's budget.

Of course history has shown us that the Administration was unable and/or unwilling to fulfill its commitments to Congress and aviation users. While we don't want to dwell in the past, we feel it is important for the Subcommittee to understand the way in which the Administration's betrayal of trust has affected NATA Members' attitude toward the current reauthorization process. For that reason, we have included with this statement a reprint of an article entitled "How the Reagan Administration Betrayed Aviation" that was published in NATA's monthly newsletter in

1983. It is easy to see how many NATA Members' attitude is simply "I told you so," or "Let's not let this happen again."

Nevertheless, fixed base and air taxi operators are still committed to modernization of our nation's airports and airways. They simply want more concrete assurances that their tax dollars will be spent for capital development.

History has shown that the best conceived funding program simply will not work as planned without effective protections and strong incentives to ensure that annual appropriations equal levels authorized. During the past five-year program, we have all learned a lot about penalties. As you will recall, NATA was a leading advocate of the so-called "two-for-one" penalty, and we are pleased it worked when appropriations fell short of authorizations. We strongly encourage this Subcommittee's support of that penalty in the reauthorization legislation.

Even with the retention of the two-for-one penalty, we feel additional incentives must be included to ensure adequate spending. NATA supports taking the Trust Fund off budget. We also encourage implementation of a trigger tax to reduce tax rates on an annual basis if appropriations do not meet authorizations. Even though our Members are tax collection agents, and would be forced to adapt to changes in tax rates on an annual basis, they are willing to play that role to help ensure full spending.

One final issue of concern to NATA Members is the Trust Fund contribution to FAA's operations and maintenance expense. Fixed base and air taxi operators remember the original intent of this Act -- to provide funds for capital improvements. They have been witnesses to the continuous attempts over the years to redirect the Trust Fund to pay for operations. Our Members would prefer a program that is exclusively capital intensive with no contribution to O & M. Such a program, of course, could be funded with greatly decreased taxes.

We realize that this type of program will never be enacted, but many of our Members still advocate this approach. At any rate, NATA Members are unnanimous in their opposition to the Administration's efforts to fund 75 percent of O & M from the Trust Fund.

In summary, Mr. Chairman, the Members of NATA appreciate this opportunity to present our views to this Subcommittee. We realize we have not addressed your specific questions concerning the progress of the NAS Plan or FAA's research responsibilities; we leave that to other witnesses with more specific expertise in those areas. Instead, we have tried to express to you our concern over the overall structure of the reauthorization and our sincere desire that Members of this Subcommittee will support additional incentives to ensure adequate spending.

We look forward to working with you toward that goal.

Reprinted from the September 1983 issue of AirTran News, the monthly publication of the National Air Transportation Association

Side One

How The Reagan Administration Betrayed Aviation

A Chronology

Prologue

Many political decisions made in Washington can be covered up and kept from public view — but not the Reagan administration's recent betrayal of the aviation community on taxes and spending. An in depth analysis of this breach of faith isn't necessary — the actual words of the people involved tell this story best.

September 30, 1980

"... surplus of $5.4 billion."

The 1970 Airport and Airway Improvement Act requires leaving a surplus in the Airport Trust Fund of approximately $4.4 billion.

March 18, 1981

The Reagan administration proposes increasing the Airport and Airway Improvement Act. The bill provides for greatly increased user taxes — including an increase in jet gasoline taxes to 15¢ per gallon and increasing to 17¢ per gallon; and a jet fuel tax starting at 20¢ per gallon and increasing to 22¢ per gallon. The bill also calls for much higher funding of the Federal Aviation Administration's operation and maintenance (O&M) from the Aviation Trust Fund.

"... greatly increased user taxes..."

July 27, 1981

Sen. Nancy L. Kassebaum (R-KS) states in a Senate Finance Subcommittee hearing on aviation taxes: "For too long, the [Aviation] Trust Fund surplus has been a source of OMB [Office of Management and Budget] seed-nut for its dedicated purpose. And rather a positive success to the overall federal budget deficit."

"... Trust Fund surplus has been a source of OMB..."

October 14, 1981

Rep. Dan Glickman (D-KS) says in a House Ways and Means Committee hearing on aviation taxes: "For too long, the [Aviation] Trust Fund surplus has been a source of OMB [Office of Management and Budget] seed-nut for its dedicated purpose. And rather a positive success to the overall federal budget deficit."

"... OMB will fight tooth and nail on capital expenditures..."

December 14, 1981

Rep. Jack Kemp (R-NY) tells a constituent: "...despite $2.7 billion in unobligated funds now sitting in the Aviation Trust Fund, OMB has been reluctant to approve airport improvements. Apparently that Trust Fund figure can be used to balance the deficit, at least on paper."

"... OMB has been reluctant to approve airport improvements."

January 28, 1982

The FAA proposes the multi-year National Airspace System (NAS) Plan for modernizing the air traffic control system. The Plan calls for $10 billion in improvements to be paid for with aviation user taxes.

January 31, 1982

The Reagan administration releases its fiscal year (FY) 1983 budget proposal and calls for implementation of the NAS Plan. The budget includes avgas taxes starting at 12¢ per gallon and increasing to 20¢ per gallon, jet fuel taxes starting at 14¢ per gallon and rising to 22¢ cents per gallon. Funding for airports is set at $450 million per year.

"avgas taxes starting at 12¢, jet fuel taxes starting at 14¢..."

May 24, 1982

Before the Senate Aviation Subcommittee, Transportation Secretary Drew Lewis tells Sen. Bob Packwood (R-OR) about Aviation Trust Fund use: "...if there is any way you can lock us in, in terms of legislation, we would be pleased to be locked in so we are obligated. We feel very strongly the money is needed. We do not see this as a budget balancer. And I am sure [OMB Director] Mr. Stockman will work with us because he has accepted the need for airports."

"... we would be pleased to be locked in so we are obligated..."

May 24, 1982

FAA Administrator J. Lynn Helms in the same hearing, responds to the same question from Sen. Packwood: "Mr. Stockman did pledge to work with us across the board. So we do not have any qualms at all, it was that specific commitment which Mr. Stockman made that we would draw down the surplus and not let it go back up."

"... Mr. Stockman did pledge to work with us..."

May 24, 1982

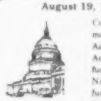
The Reagan administration responds to a question submitted by Sen. Howard Cannon (D-NV) at the May 24 Senate Aviation Subcommittee hearing: "...we are committed to system modernization and enhancement of aviation services, if the users are willing to pay the allocable costs of development and acquisition, and also operation and maintenance of the system."

May 24, 1982

NATA testifies before the Senate Aviation Subcommittee: "...our Members voiced a very concerned outlook for the future as well as a great deal of distrust for both Congress and the administration because of the way the Aviation Trust Fund has been handled since its inception in 1970."

"...our Members... voiced a very concerned outlook... and a great deal of distrust..."

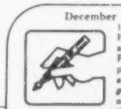
August 19, 1982



Congress enacts the multi-year Airport and Airway Improvement Act, which includes funding for the FAA's NAS Plan, increased funding for airports improvements, and increased user taxes (11¢ per gallon on avgas and 14¢ per gallon on jet fuel).

"...increased funding...increased user taxes..."

December 1, 1982



16 House leaders urge President Reagan to spend Aviation Trust Fund money for the purposes intended, as promised: "Congress agreed to increase aviation user fees on the strength of assurances from the administration that the increased fees would be spent for aviation capital development at the levels authorized in the Airport and Airway Improvement Act. We strongly urge the administration to respect these commitments. If spending were set at less than the authorized levels, the rationale given by the administration for the higher user fees would prove to have been groundless."

For More Information Contact: NATA • 1010 Wisconsin Avenue, NW, Suite 405 • Washington, DC 20007 • (202) 965-8880

How The Reagan Administration Betrayed Aviation

A Chronology

December 16, 1982

Rep. Norman Y. Mineta (D-CA) speaks out for aviation spending in a speech on the House floor. " *the Congress agreed to increase user fees and spending for operations only after receiving assurances that the administration would support capital development.* "

December 23, 1982

Congress increases FY 1983 airport improvement funding from $793 million to $993 million.

January 20, 1983

Elizabeth Dole, nominated by President Reagan for the post of Transportation Secretary, answers a question from Sen. Nancy Kassebaum on Aviation Trust Fund expenditures during a confirmation hearing before the Senate Commerce Committee: " *[o]ne way that we can fix the AIMS money is concerned, it is certainly not the union of [OMB or the administration to use the funds in that Trust Fund to offset the deficit.* "

January 31, 1983

The Reagan administration releases its FY 1984 budget which requests facilities and equipment funding of $1 billion — not the $1.393 billion contained in the Airport and Airway Improvement Act. Fund ing requested for airport improvement is $700 million, not the $993 million authorized

May 11, 1983

Transportation Secretary Dole speaks before the Regional Airline Association. " *As for the F & E funding, the $1 billion in the President's budget represents all the projects the FAA believes it can begin contracting for in 1984.* "

May 12, 1983

Secretary Dole addresses the Radio Technical Commission of America. " *We [Dole and Rep. Norman Mineta] are both committed to seeing that adequate funds are provided, and in that context, we would both like to see the President's request for $1 billion in F & E funding for FY 1984 fully funded by the Congress.* "

"We are...committed to seeing that adequate funds are provided..."

June 22, 1983

The House passes FY 1984 aviation appropriations. F & E funding is set at $985 million. AIAP is set at $900 million.

"...AIAP is set at $900 million."

July 12, 1983

The Senate Transportation Appropriations Subcommittee recommends FY 1984 aviation spending far below the amounts originally authorized — $750 million for F & E and $800 million for ADAP.

"...$800 million for ADAP."

July 13, 1983

Transportation Secretary Dole writes to Sen. Mark Hatfield (R-OR), chairman of the Senate Appropriations Committee. " *Barring any unforeseen circumstances, the Department can operate effectively within the [Senate Transportation Appropriations] Subcommittee's levels. In particular, FAA Administrator Helms has indicated that the FAA levels, although reduced below those requested by the administration for FY 1984, will not severely impair the implementation of the NAS Plan, in 1984.* "

(A reliable source informs NATA that Helms learned about Dole's letter after the fact. — Ed.)

July 14, 1983

OMB Director David Stockman writes to Sen. Mark Hatfield: " *...it is imperative that the levels adopted by the Senate Subcommittee become the ceiling for subsequent deliberations. While the levels contained in the Senate Subcommittee bill are acceptable to the administration, any net add-on during either Senate consideration or in conference [with the House] would make it difficult to recommend favorable action to the President.* "

"...difficult to recommend favorable action to the President."

July 15, 1983

The Senate passes FY 1984 aviation appropriations under pressure from the administration. The result is sharply reduced spending: $750 million for F & E; $600 million for ADAP.

"...sharply reduced spending..."

August 2, 1983

Under the threat of a veto by President Reagan, Congress passes the Senate's version of 1984 aviation appropriations.

August 3, 1983

Rep. Norman Mineta summarizes the anger and frustration of the aviation industry in a speech to the House of Representatives. " *Less than a year ago, that Congress raised aviation user taxes to fund higher authorization levels for badly needed aviation programs. We did so at the urging of the administration. I see no valid argument against cutting aviation user taxes across the board.* "

"...I see no valid argument against cutting aviation user taxes."

Epilogue

Perhaps the solution to this chronology will be a lowering of aviation taxes. NATA is resolved, however, that attempts must continue to obtain full funding of aviation programs. The Association's leadership has reasserted its position that modernizing the air traffic control system is paramount and is essential to the long-term survival of aviation.

The FAA presented evidence showing that modernization can continue on schedule — if FY 1985 funding is increased.

We agree with Administrator J. Lynn Helms when he told Members at NATA's 1983 Convention that they should "take the position that it's your money and get it (higher funding levels) pushed through."

Mr. MCCURDY. Thank you, Mr. Power. We thank each of the witnesses for their statements. As I indicated earlier, your full text will be admitted into the record.

There are a number of questions, of course, that arose because of the breadth of the testimony given, and I want to start I guess back in order. I was making notes as we were going through.

Mr. Fleming, and actually most of the witnesses alluded to this, Ms. Matthews in her conclusions came to the same point. Her statement is that daily the NAS Plan is being subjected to re-evaluation and potentially killing the scrutiny, where we dissect and examine modernization programs until funding becomes exhausted or diverted to other needs, without realizing the true pctential of the ATC system.

You talked about the complexities of the procurement process and the inability to fund the program adequately and consistently. You talk about the OMB pass back of $1.7 billion. Everyone keeps coming back to the point that the NAS Plan was a good plan, that we authorized it, and this Subcommittee actually started it long before I was on the Subcommittee, and has been supportive and yet we look at the questions of the automation system and the delays and the schedule delays, and I am new to this Subcommittee, since I was elevated to the Chair, I sometimes question that if we were doing this in DOD, we would be having some heads over there probably.

I don't quite understand where the fault really lies. We have nice printed statements here. Where would you narrow it? Where does it directly go? Is it to this Subcommittee? Is it the Appropriations Committee? Is it the Administration? Is it the FAA? Is it the Secretary of Transportation?

Where is it? Let's be honest and forthright here. Let's get down to the bottom. I mean, if we are going to deal with this problem, we need to identify it.

Mr. FLEMING. Mr. Chairman, I would say the fault lies with all of the parties you nominated and probably some others that you didn't, and that could include some of us here at this table.

First of all, I think it is very clear in retrospect that the program has been starved for funding at the front end. Any time that is done with a large complex program, it makes no difference whether it is in DOD or DOT, the inevitable result is stretch out and a rapid escalation of total program costs, and that is exactly what has happened to the NAS Plan.

Mr. MCCURDY. I agree with that to the extent that I hear that a lot in DOD also, and I am on the Research and Development Subcommittee, so I see R&D in the civilian sector and also in DOD. We also get some programs—when you are stretching technology, and I guess this really comes to where we need to divide it here, when you are stretching and you are out on the lean edge of technology, there are sometimes some hurdles that create some real funding problems down the road.

Is it your understanding that we were pushing the technology too far, as far as we could or was it more on the implementation of the plan? Was it too far reaching?

Mr. FLEMING. Not in my view, Mr. Chairman. I don't think the program was ever viewed as stretching technology. As a matter of

fact, I think when Mr. Helms put the program together at the FAA, he intentionally avoided significant technical risks. Now, there is very clearly enormous software risk in this program and those of us who—that probably includes everybody in this room who deal from time to time with vendors who have to put together complex systems, automated systems—are constantly reminded that the problem is often times, most often, not in the hardware but rather in the software.

I think we do have those kinds of problems ahead of us. The AAS, the Advanced Automation System, may be a perfect example. The host computer replacement program for the centers even fell behind, but I don't believe that was due to the difficulty that the vendor had in manufacturing the hardware. After all, it was a fairly standard computer.

However, the software documentation among other problems proved to be a more formidable difficulty than originally anticipated and the program was delayed.

I think funding is one of the clear problems. Inevitably, the whole overall system of management of the program has to be called into question. Very frankly, a lot of us in the airline industry wish that FAA had been charged by the Congress with choosing rather than a systems engineering and integration contractor as we know it today, a prime contractor, who was totally responsible for management, installation of that NAS Plan and bringing it on stream with significant financial penalties if that were not done. But it didn't happen that way.

We can't go back now, I don't think, and change that. FAA in fact makes the technical choices, the technical decisions and there have been some difficulties with some elements of the program, but I think we would all agree, those problems likely would occur in anybody else's program, too.

FAA is not perfect but I have never run across a large organization that is.

Mr. McCURDY. Other witnesses care to comment or jump in on that one?

Mr. SHEEHAN. I couldn't bear to miss that one, Mr. Chairman. That's a big target.

From our standpoint, one of the big faults of the NAS Program is it was sold as a package. It was sold as a monolith, something that had to be closely tied together and integrated and therein lies part of the fault. There is a great diversity of programs in there. In fact, a lot of people have referred to it as a loose collection of programs in search of a solution.

I don't think that was the proper tack but that was the way the then Administrator of the FAA sold it, sold it as a package saying you have to take it as a package or it isn't going to work. Of course, from his standpoint, and I think it's understandable that there were certainly funding arguments for that particular approach, especially with the Congress, and unfortunately, the program is sold based on 1981 technology.

I'm not saying we cut off any sort of R&D or advancement of technology at that time, but it was sold on that basis. Unfortunately, the thing that a lot of people didn't realize at the time is the

technology to make this work had not been developed in many cases at that time.

I have to take a little bit of an exception with my colleague here concerning funding. Something in excess of $500 million has been obligated for the program but not spent. I guess to me that means that there has been a failure in program management for this program. The money has been there, but the FAA has literally been unable to spend that money on some of the more critical programs.

Getting into again something that Mr. Fleming talked about, a systems engineering integration contractor, should that have been a prime contractor. I don't know. It seems to me that the $700 million that we will have eventually expended upon the SEI contractor, and that is Martin Marietta, could have been better spent if the contract had been written to make the SEI contractor more of a partner rather than in a very subservient role to the FAA.

Obviously, we have no strong feelings about this. I would be glad to answer any other questions. That's the principal reasons we see that we are not getting there from here.

Mr. MCCURDY. Well, the charts that I have seen that have actually charted the funding plan on NAS and the budget's history, the authorization has generally exceeded the request and the request has generally exceeded the appropriation. Now, that says something right there, that we have been ahead of both the Administration and the Appropriations Committee.

Now, I think a lot of that comes back to the question which I have on the Trust Fund, and how we spend money from there or appropriate monies from that for this particular plan, and I think Ms. Matthews had raised that question and talked about taking it off the budget.

It appears to me in just an initial observation that both the requests and the appropriations have been lagging on the funding side. It also may indicate some of the problems on the management side, which also goes back to your question about the software.

We want to deal with software in a totally different category. We can't do that in R&D. Software is as much a problem of R&D as is hardware. I don't care whether it is in the shuttle or SDI or the B-1 or WAT system. The software is a function of all of them.

Would anyone else—Captain?

Mr. MCNAIR. Chairman, just a couple of philosophical points possibly. One of the differences seems to be between R&D with respect to the NAS Plan and what goes on with DOD, is we seem to be worried about competition with DOD. We seem to be worried about an enemy or a perceived enemy and that they will get ahead of us.

In the NAS Plan, our only competitor has been ourselves. We can't seem to get going. Out of all those people that you want to blame there, if I could pick one, I would pick the Administration, and of course, that has to include DOT and FAA, but that's where the slack has been, so just with those two points.

Mr. MCCURDY. Has there been a change in the Administrator? I mean now we have another change. That concerns some of us, uncertainty is always a very difficult thing to deal with. We sometimes wonder whether the Administrator has enough flexibility or control or discretion to move forward and how much of that is being directed from the Department itself, the supervisors or the

Secretary's Office. We sometimes have some difficulties, even in my short term as Chairman of this Subcommittee, I seemed to pick that up.

We keep asking for the appropriate representatives of that office to appear and they refuse to do so. We may end up having to exercise a subpoena before we get them to come talk to us.

I appreciate your comment.

Ms. Matthews?

Ms. MATTHEWS. I'd like to make a couple of comments. First of all, on the question of money being obligated but not spent, I'm sure the Subcommittee is aware that most of the projects at FAA are on a full funding approach, and just because the money has not actually been spent, doesn't mean it's not there, ready to be spent on projects that are moving forward.

The second thing I'd like to say is automation is the only game in town and what's the alternative? If we keep looking back and saying the technology is two years behind, well, you know, that's always going to be the case. Today, our controllers are working with paper flight strips. What's the alternative? We have to automate the system. If we are going to have more capacity, automation is the only way we are going to get that. We do have to go forward in some fashion.

The last thing I would like to say, and Mr. Fortier may have something more to add to this, is we are looking at higher funding levels for F&E for next year and we recommended $1.6 million because a lot of the R&D is behind us now and that money needs to be spent on actually buying equipment. That's why this year is crucial to having big amounts of money added to the F&E appropriation, in addition to the RE&D.

Larry, do you have something to add?

Mr. MCCURDY. Do you have any—what is your perception of some of the problems within the appropriation process as far as appropriating monies for research out of the Trust Fund? What is the hesitancy there? I mean, many of you have probably testified over there and you have worked that Committee as much as you have this one and others. What do you perceive as the difficulty there?

Ms. MATTHEWS. Part of the problem, I would think, is low budget requests. This year we have a request for $150 million.

Mr. MCCURDY. The Administration's request?

Ms. MATTHEWS. The Administration's request, and there are a lot of projects that could go forward, for example, the ones I noted, advanced traffic management system and we have AERA 3 out there and these are programs that will give us real capacity gains and these are the things—you know, those are things that can be slowed down without too much ripple being felt right away, they are things that are useful.

Mr. FORTIER. Mr. Chairman, if you are really going to realize the benefits of the other investments that are being made, you have to go on with the research and development projects that will increase capacity and reduce delays in the system, otherwise much of what you are investing today is just going to sit out and you are not going to be able to get the full benefit out of the advanced automation system, the NEXRAD, systems of that nature. You have to have an aggressive R&D.

Mr. MCCURDY. I just want to ask one last question before I recognize the gentleman from Pennsylvania and then I will come back for some follow up, but we were to have FAA come in today and when we were looking at the schedule, staff said we normally have FAA first and you follow. I wanted to reverse that this year. I like to have a little dynamic tension develop before we have these authorization hearings.

If you had one question that you would ask the FAA tomorrow, what would it be?

Mr. Fleming?

Mr. FLEMING. What are your real RE&D needs, and I'd like to echo in that context the statements just made by my colleagues from ATCA. The problem starts with an inadequate Administration budget request. That's very clear. I think we have heard that in one way or another from everybody at this table this afternoon. Then the appropriations process wends its way and FAA has come up short of its needs.

It's very difficult as you can tell from reading our testimony, and I'm sure from your own experience, to find out what those program managers in that Agency really believe they need to do the job that needs to be done, because it gets scrubbed several times by the time any of us see it, so that's the reason I recommend the one question.

Going back to a point Ms. Matthews made, true, the NAS Plan is not current technology in the sense that if we were going to sit down and devise such a plan today, it would look quite different, but it is a plan. It is desperately needed. The air traffic controllers who are trying to move airplanes today are working with equipment which is out dated in many respects. Reliability is decreasing. We have got to get on with this program and get it completed.

Thank you.

Mr. MCCURDY. Any others? Mr. Sheehan?

Mr. SHEEHAN. Let's get back to your question of what question would we ask the FAA, and the only thing I can think to ask, although I know you are going to get a very elaborate answer that won't be too meaningful, is why aren't we any further along than we are today. That's a tough one.

Yes, I guess I was the one who brought up the fact that we have to re-evaluate what we are doing here. I put that in the context of the big payoff system of NAS, the advanced automation system, and that was essentially supposed to be fully implemented by 1994.

If we get that by the year 2000 under full implementation, we are going to be very, very lucky. My thought is, will we really need that system? Will that system be applicable and meet our needs in the year 2000? Certainly, it may have met our needs in the year 1994, but I'm sure it won't in the year 2000.

Mr. MCCURDY. They are talking about the 1993 projected IOC.

Mr. SHEEHAN. Initial operational capability, but that's not going to give what they have been promising, the full random flights of all high speed, high altitude traffic, which is supposed to be the real efficiency payoff in the system.

We have technologies that are overtaking us, and that is the technology of satellites, that will open up new windows for us, that

we may not be able to fully integrate using the system we have today.

Mr. MCCURDY. Captain McNair?

Mr. MCNAIR. Chairman, you should ask them a question to which you can get no answer yet, but which is of critical importance and that is who is the new FAA Administrator going to be. Who is going to take on an 18 month job?

Mr. MCCURDY. Do you have any suggestions?

Mr. MCNAIR. We may, and we will get into that later, but we have been actually very well pleased with Admiral Engen, but part of the problem with FAA and any of their programs through the years has been—that has never been a long tenure job as Administrator of the FAA. The new person, whoever it is, is going to put their stamp on it, and should put their stamp on it; that's correct.

So, that's very critical, as to what is going to happen between now and 18 months from now.

Mr. MCCURDY. Well, I agree. I think Admiral Ingan did a good job. His decision which might be speculation, maybe some of the frustration of the internal politics as opposed to other considerations, but that is just a personal observation.

Anyone else?

Ms. MATTHEWS. May I make one response to something Mr. Sheehan said before? I think you made a very good argument for why we need more R&D funding. We are going to have the AAS coming on line in 1993 and the R&D funding is very important to have those software and other types of advanced technologies available to plug into the AAS, so that we will get the capacity gains sooner. That's the reason that we need the R&D funding today and not tomorrow.

Mr. MCCURDY. Thank you. The gentleman from Pennsylvania is recognized for as much time as he may consume.

Mr. WALKER. Thank you, Mr. Chairman.

If you had to pick out one priority for R&D funding for the FAA for this year, what would it be? Mr. Fleming?

Mr. FLEMING. I'd have to go with the Advanced Automation System, but getting back to a point that was made by Mr. Sheehan, I don't entirely agree with him, most of that program is very closely interrelated and in fact, most of the pieces of it have to move forward together. The one exception I know of is the Microwave Landing System. That program can be dealt with separately, but for example, when you look——

Mr. WALKER. That's the Doppler system?

Mr. FLEMING. No, sir; the Microwave Landing System. For example, when you look closely at the Advanced Automation System program, you find out that the interim sector suite, which is the piece of hardware we are talking about for the initial operational capability in 1993, is dependent upon something called the Voice Switching and Control System, and if that program comes unraveled, then the other closely related programs will be delayed also.

So it does have to march down the road together and it is very difficult, Mr. Walker, to pick one priority item.

Mr. WALKER. Okay, but you picked the Advanced Automation System. Mr. Sheehan?

Mr. SHEEHAN. I'd have to pick systems capacity and delay reduction. That's going to get us the shortest term improvement to the system, something that we desperately need today.

Mr. WALKER. Okay. Captain McNair?

Mr. MCNAIR. Since it has been so long neglected, I would pick human performance research. It has been long neglected and severely underfunded and if we can do some good work in that area, we may significantly increase our safety.

Mr. POWER. I'd pick the advanced automation system but since my second choice hasn't been offered, I think NEXRAD should be concentrated on heavily.

Mr. WALKER. The Doppler?

Mr. POWER. Yes, general Doppler and NEXRAD programs.

Mr. WALKER. Okay. Very interesting, I mean all of you—some of you have the same priorities. Some of you have different priorities. In the case, of course, of the advanced automation system, you have picked the one where the Administration has reduced the funding by a fairly significant amount, which I suppose is the reason why you are concerned about it. On the other hand, for this Subcommittee, it becomes a question of where do we get the bucks. You know, if we are going to enhance that, even back to its 1987 authorization or appropriation level, the fact is we are going to have to take it out of someplace else.

Let me pose that question. Where would you take it out of? Mr. Sheehan?

Mr. SHEEHAN. I think the easiest answer there is for a proposal that has been mentioned, to take the Aviation Trust Fund off budget and you are going to have about $6 billion.

Mr. WALKER. It's not in the jurisdiction of this Subcommittee, so you are going to have to tell me where within the amount of money we have to deal with here, the millions that we are talking about, where in R&D would you take money out in order to put money in other places in R&D?

You have defined for me your priorities. That's very helpful to the Committee. Now, what are of lesser priority where we can find the money?

Mr. SHEEHAN. We can do that for you but it's going to take me a while. We all came here with the thought that the projects that are in the RE&D budget for 1988 right now are all very credible, deserving projects. We just don't think there is enough of it.

Mr. WALKER. I understand, but I'll tell you one thing, I mean, virtually everybody who comes before Congress, virtually everybody who walks through my office says, we want to do everything. There is nobody who comes in that doesn't want to do everything; we want to do it all.

The fact is, you know, somewhere along the line, there have to be priorities set, and we can't do it all. There simply is not enough money. I don't care if you take the entire budget off budget. The fact is we don't have sufficient money to do it all.

If we are going to ask FAA tough questions tomorrow and we are going to begin to detail this, my question for each of you is, okay, where do we begin to nail them down? If you want to find an additional—somewhere in the vicinity of $14 million just to get back to the 1987 appropriation level in advanced automation systems, I'd

like to know, where in R&D can we find $14 million bucks, because that is what this Committee does. We don't have jurisdiction beyond the R&D programs.

Mr. SHEEHAN. I'll submit that for the record.

[The information to be furnished follows:]

[Note: Information not received.]

Mr. WALKER. Okay. Thank you. Others?

Mr. MCNAIR. Mr. Walker, we'll certainly provide some advice for the record, too, but I couldn't miss the opportunity to point on the obvious.

Mr. FLEMING. The dilemma you highlight is the very reason that's driven ATA to recommend a National Aviation Authority to deal with the problems that you've just highlighted.

Thank you.

[Information to be furnished follows:]

[Note: Information not received.]

Mr. WALKER. Why don't we privatize the whole system? Wouldn't that, in fact, solve some of these problems, if, in fact, you moved it off, put it on government contract and privatized the system?

A lot of the problems that you have just outlined here today would be solved overnight by privatizing the system and assuring that the system then responded to the goals met by the Government. And you wouldn't have to worry about the trust fund, then, because we would have to spend out the trust fund in order to meet the goals of the contract.

Wouldn't that be a logical way to proceed?

Mr. FORTIER. It may be a way to proceed, but would that resolve a problem?

Mr. WALKER. Well, it would resolve a number of the problems that you have discussed here today, because the fact is that the funding problem, then, would be one for the Federal Government to resolve. Rather that saving the trust fund money, we'd have to figure out a way to meet the demands of our contract every year.

If the contract took more than what the Government was willing to appropriate, we would, in fact, have to find ways to use that trust fund money to meet the terms of the contract, and you would, in fact, end up with a far different funding pattern than you have today.

It seems to me we would also eliminate some of the problems that we have—that I have dealt with for some years, not only in this committee, but in other committees—when the FAA goes out and selects a TCAS system instead of an ACAS system, because what they're basically looking to do is preserve a bureaucracy with the system that they select.

I think that it might well be that if you had some kind of scheme that suggested that it was not a very economic thing to do, to preserve bureaucracy, that you might get better technical solutions to some of these questions, rather than the technical solutions that seem to fit with the general bureaucratic framework that now exists.

Mr. MCCURDY. Would the gentleman yield?

Mr. WALKER. Yes, I'd be happy to yield.

Mr. MCCURDY. Could the gentleman explain to me how, if you privatize and have a contract—and I assume the contract would be negotiated, and you're still using government funds to pay for it—how that resolves your funding conflict? I'm not following you there.

Mr. WALKER. Well, in large part, what we would have to do, we would have to RFP the system, and a safe system would demand certain kinds of things that would be expected on the contract. We would end up having to find the funding. The logical place for the funding is the trust fund funding. It would force us to respond here within the budgetary framework to the demand of the contract, rather than making arbitrary decision that we are simply going to hold a lid on the trust fund.

Mr. MCCURDY. But if we have an authorized plan for NAS, which was actually started in this subcommittee along with the work that Administrator Helms did, and we have a plant, how does a contract differ from a plan? Either you're going to fund it, or you're not. You're either going to support the plan, or you're not, whether it's in terms of a contract or legislation. It doesn't appear that we've done either.

Mr. WALKER. No. There's a big difference between a contract and a plan. We can decide whether or not to implement the plan over a long period of time, but we have to fulfill the terms of the contract based upon the contract.

What we've done with NAS is, we have simply refused to meet the obligations of the plan that was put forward, and we have underfunded sections of it continuously, either because the Administration budget request has been too low or the appropriations request has been too low. If you're operating under a contract, you can't refuse to do that, unless you go back and renegotiate your contract.

Mr. MCCURDY. Well, perhaps we ought to be looking at legislation in terms of contracts, and that's how I tend to look at the legislation, that if we have agreements, and the Administration—there was an agreement on the NAS plan, then the fact we had a contract and the contract is written, and they're not living up to their end of the contract, and that's making the request sufficient, fund it.

Mr. WALKER. But there is no contract with regard to most of these plans. There is simply a decision with regard to the Congress that we accept this plan. But then when it comes to implementation of the plan, we simply don't live up to that, and we do that constantly around Congress, because other priorities all of a sudden impinge on the——

Mr. MCCURDY. Well, I understand the gentleman, and if he'd yield further, I would just say that one of the other privatization efforts was LANDSAT, and I have yet to see the Administration live up to the commitments there. And I just have a hard time seeing how that automatically solves our problem.

You still have a failure, evidently from a management standpoint, to identify the needs and address them with adequate resources, and either sell that within the Administration or here on the Hill, at least on the appropriations side.

Mr. WALKER. Well, but let's remember, on LANDSAT, Congress wasn't willing to go along with the total privatization plan either. We weren't willing, for instance, to include the weather data in the LANDSAT plan, which was where the profitability was upfront in the plan, and therefore it became very difficult to accept that particular program because the profitability was down the road about a decade in the program.

So Congress definitely interfered with that privatization plan by not taking the entire plan as presented and basically coming up with half a plan.

My guess is that if you're dealing in air traffic control systems, you probably wouldn't want to deal in half a plan there either, and that you at least would come up with some kind of a contractual obligation.

All I'm suggesting is that sometimes we tend to deal with these things at the edges. If you want my own opinion of the situation, what these people are saying is absolutely correct, and it's absolutely essential to the long-term health of the air traffic control system, and there is no way we are going to get sufficient money out of this Congress or this Administration or, for that matter, the next Administration to do everything that's being suggested here.

It is one of those areas that we react strictly to tragedy, and then we react in the narrow area where the tragedy occurred, and we all of a sudden dump money into that in hopes that that tragedy won't occur again. And that is the only way we respond to these particular problems, and personally I find that tragic.

Mr. MCCURDY. Well, I thank the gentleman. And certainly his opinion is valued in this subcommittee, as it is in the Congress, and we appreciate his position.

The gentleman from Maryland is recognized for as much time as he may consume.

Mr. MCMILLEN. Thank you, Mr. Chairman.

I would like to just get some background on an issue that's of great concern to me, and I know that it probably wasn't touched upon here, and that is the state of noise abatement around the country.

The chairman and I went out to Baltimore-Washington Airport, and we looked at that airport and some of the human tragedies involved with an expanding airport system across the country. And one of the points that was brought up in the meeting that we had out there was the potential for the microwave landing system, and maybe if you could just give me some background on it, your opinions of it.

I understand that it's having some problems being put in place, and the procurement has been delayed a couple years, and that the Airline Pilots Association has recommended that it be in place by 1998.

What specifically also can that system do to really abate the noise problem that we have in the airports?

Mr. FLEMING. Mr. McMillen, the airlines have been concerned about the noise problem for many, many years, and we do indeed have a serious national problem, and, of course, that's the case in the vicinity of BWI.

I am sorely afraid that the virtues of the Microwave Landing System as a means to abate noise in the vicinity of airports has been oversold for these reasons.

First of all, with the current generation of aircraft we have in the airline fleet, we are not going to be able to increase glide path angles--that is, the angle of descent—and operate safely. There are only two ways you can abate noise, and one is to increase the distance between the listener and the noise source, and the other is to reduce the amount of energy at the source of the noise, the engine for the most part.

Increasing a glide path angle would be a means, if it could be implemented safely, of increasing the distance. The other way it could be done is by means of a curved or segmented approach. But there is a great deal of research and development work that needs to be done yet as to how that technique could be applied. Captain McNair referred to it in his testimony, in fact. And in ours, we advocated additional funds for evaluation of that technique.

Some have suggested, for example, that we could have very large airplanes—747s, DC-10s, L-1011s—making curved approaches with a very short straight-in segment, perhaps only a half mile long. I don't think Captain McNair's colleagues, nor those of us in airline management, are convinced that we are going to be able to do that. And in many cases, there may not be any noise alleviation if we can't have a curved approach segment that close to the airport.

I think also it's instructional to consider what happened here in the Washington area when the FAA developed a plan for redistribution of noise energy to neighborhoods that had not previously experienced it. The COG said no, and the plan was never put into effect. So the "share the noise" program in the vicinity of Washington was put aside, and I am afraid that history shows us—or history tells us that we could expect a similar reaction near most airports.

Therefore, I conclude that the noise alleviation benefits of Microwave Landing Systems have probably be oversold, but I would not dismiss them out of hand.

Mr. SHEEHAN. For the first time in my life, I'd like to endorse everything that my colleague from ATA has just said. [Laughter.]

And perhaps add the fact, the FAA has sold MLS for all the wrong reasons. They sold it initially on the concept that it would increase capacity and that it would alleviate noise. And too slow, we've come to realize the fact that that's just not true.

Now there are some other operational safety advantages that will accrue to MLS, especially as we get more crowded and more capacity into the late 1990s. But believe me, noise is not one of the selling points for MLS.

Mr. MCNAIR. You're going to have another start in a moment, because ALPA agrees with what Mr. Fleming of ATA said.

Certainly where there are siting location problems for ILS, MLS has some possible benefits. We also believe that some of the figures, projected figures, for airport capacity improvement for MLS are greatly inflated. They are still making an MLS approach to intersecting runways or runways that cross. Many times the problem is on the ground.

So again, we're saying that the way to get rid of the noise, or the most noise we can, is at the source, make the airplane quieter to start out with, and there's been tremendous improvement in that and tremendous improvement in the technology, and hopefully as we proceed further and further along that program, airplanes will get quieter.

But communities are going to have to realize, in a deregulated environment with a hub and spoke concept that people have gone to, that more and more people are going to be impacted by noise. But there's a flipside to that coin, that there are going to be jobs and all created in that community and some revenue to that community, and to put up with that, it's going to take some inconvenience. And that's unfortunate, but true.

Mr. McMILLEN. Well, unfortunately that doesn't do a lot of good to the person who bought a home years ago and finally sees all this noise upon him every day of the week.

I mean, the question that I want to follow up with, it's my understanding that on Stage 2 aircraft that the prohibition date is like 2210; is that correct?

Mr. FLEMING. There is none.

Mr. McMILLEN. There is none? I thought that there was a date, but it was set so far in the future to be largely impractical.

Mr. FLEMING. There is discussion about such a matter, and there are two different frameworks within which that discussion is taking place.

One is a proposal to require a cutoff of aircraft production, Stage 2 aircraft production, after some date certain. A second far more economically onerous proposal has to do with a date beyond which one could not operate a Stage 2 airplane, and that's the context, I think, within which those discussions are taking place, and I would expect that there will be some detailed discussions within the Congress during this session on that very matter.

Mr. McMILLEN. Well, this happens to be one of the most important issues in my district right now. I get as much mails and as many phone calls—I mean, people are very, very concerned about this, and, you know, clearly it is a federal problem, and most of the funds for airport mitigation are from the Federal Government.

What, in your opinion, can be done—I mean, if you just had to pick one thing that we could do to solve this noise—or at least alleviate some of this noise, what would you suggest? I would just be interested in your thoughts.

Mr. FLEMING. The most promising technique is the one that Captain McNair has already pointed out, and that is the introduction of additional Stage 3 airplanes, which is taking place in the normal course of business within the industry.

If one were to objectively assess, for example, the impact in the Georgetown area of a Boeing 757 departing to the north from Washington National Airport and then listen to a 727 depart next, you would be struck by the significant difference between those two airplanes.

Mr. McCURDY. The 757 is about what—I don't know how many thousands of feet by the time it hits Georgetown. I saw one take off this morning, and it marveled me, the angle of attack, if I can use my military terms again, but just—I was amazed at the climb. I

mean, by the time it was over the Washington Monument, it was almost out of sight. I mean, it was really going straight up.

Mr. FLEMING. Well, that particular airplane, since it's a two engine airplane, has a tremendous power reserve, since it obviously has to be capable of sustaining flight on 50 percent of the power plants available. It also has some very favorable aerodynamic characteristics.

But in this case, the airplane is providing both the benefits I mentioned. It climbs more rapidly, thereby increasing the distance between the listener and the airplane, and it also has reduced noise energy at the source.

Mr. MCMILLEN. A lot of people complain about private carrier noise, that really there are absolutely no standards at all. Is that true?

Mr. FLEMING. I'm sorry, Mr. McMillen, I——

Mr. MCMILLEN. The private carrier noise standards. In other words, you have a Stage 1, Stage 2, Stage 3 for commercial aircraft. I mean, are there any similar standards for private carriers?

Mr. FLEMING. Well, all the airplanes that operate under Part 91, the Federal Aviation Regulations Part 91 or Part 121, which are the air carrier regulations, are all subject to the same rules.

Mr. MCMILLEN. The same rules.

Mr. FLEMING. So in essence, they're within the same regulatory framework.

Mr. MCMILLEN. They are? Okay.

Mr. FLEMING. Yes, sir.

Mr. MCMILLEN. What could be done in your opinion that would be——

Mr. MCCURDY. Would the gentleman yield a minute?

Mr. MCMILLEN. Yes.

Mr. MCCURDY. Maybe I need some clarification here. If you have a Learjet that's owned by a private corporation for business purposes only, and they are not a carrier per se—I mean, it's a business jet—are they under the same regulations?

Mr. FLEMING. Subpart E, if memory serves me correctly, of Federal Aviation Regulations, Part 91, applies to all users of the airspace, and I believe that that's where the fundamental requirements are found. So in this case, the Learjet would be governed by the same set of regulations.

Perhaps Mr. Sheehan could elaborate, since he is a general aviation expert.

Mr. SHEEHAN. I don't know if I'm an expert, but I know a little bit about it.

All these airplanes, all civil airplanes in the United States operate under FAR Part 36, which sets noise standards, and there's an Advisory Circular out that complements Part 36 that says what the absolute radiated noise levels for all airplanes are.

So there are regulations for this. Let me say also that many airports have availed themselves of FAR Part 150 studies that study the actual noise footprint in the neighborhood and sets actual limits for airplanes flying over, and airplanes that don't comply with those limits just don't fly there. If you fly over there, the noise-monitoring equipment picks you up, and you're fined.

I guess one of the big things that could be done in addition to reducing the noise source is to ensure that the zoning regulations around airports are upheld and are upheld stringently. It's one of the big problems we've had, is what I call creeping zoning, where developers who are very persuasive can come into local governments and say, "Well, we'll just bend the regulation here just a little bit."

A subset of that is the fact that we can increase monies for noise abatement, to buy up noise affected areas and to create buffers by increasing the amount of money that goes into the airport improvement program funds. That amount of money for noise abatement in AIP is very, very low right now. Virtually every aviation organization in Washington has called for anywhere from $200 to $600 million to be added to that AIP money to do just that, to help with the noise problem.

Mr. McNAIR. Since you gave me one choice, I think the only solution open to the noise problem in the U.S. is federal preemption of the problem. It's going to have to happen, because the number of operations are going to increase, the number of airports impacted by noise with the hub and spoke concept, which is here—and I don't see why it would turn around now—more and more people are going out and looking for airports to operate from, and therefore ~~the~~ noise situation is going to get worse, not better, and exposure to the public.

And, you know, I wonder, there's been so much land sold in this country when runways were shut down for maintenance, and then the runway is opened 18 months later, and that's the first time the person every knew that there was an airport near them. You know, a law in this country which would say that in every real estate contract, you must identify all airports within five miles of that person's home, and you must identify it in writing.

I don't know. But I know what the problem is. It's the liability problem. I understand that, and what the cost is to pay all these liability judgments, but it's going to have to be federal preemption of the problem ultimately, because we've got this whole noise thing so much tied up with the local communities, with so many conflicting regulations and curfews and all the other things that are going on, that this could be the thing that holds back air transportation in this country more than anything else.

Mr. McMILLEN. Since you're talking about some federal preemption, would one of these possibilities be a cutoff date for Stage 2 that's reasonable?

And let me just finish up. If I had to pick—if I was going to give you a list of them, tell me which one makes sense—an early cutoff date for Stage 2; two, maybe not taking a cutoff date, but some sort of noise fee for using Stage 2. I don't know if that even makes sense, but that's an idea.

And the third one is how the whole noise question is calibrated. There is an average calibration at these airports, and we all know very well that most of the noise occurs in the morning and the afternoon. I've flown enough planes in my day in the NBA to know that that's when I did most of my flying. That's when most of the noise is hitting, and this noise is calibrated on an average basis, not necessarily on a peak basis, which is what affects most people.

Given all those things I mention, what makes sense from—you know, what is the quick and easy thing to do from a federal preemption standpoint?

Mr. MCNAIR. If I can respond, since I brought up federal preemption—none of the above. Federal preemption means you take it all, or you don't take any. And that's the problem. We have these little Band-Aid approaches.

Part of what you went through there is "decibels for dollars," you know; in other words, you can make noise, but you've got to pay for it.

Now wait a minute. How does that help the guy out there in his home? That's not what we're trying to do, is it?

And what we're saying in federal preemption is, you take the whole thing, including the—you defend against lawsuits. I say "you." The Federal Government does, okay. You have to sue the Federal Government about noise, because what's going on out there now with various states with reoccurring judgments and so forth against the airlines and airport operators, we have had numerous noise conferences where the airport operator, the guy who's in charge of trying to maintain the airport, has been tied up in court for months.

Now who's running the airport? He's testifying in court, and nobody is running the airport while he's gone, or his assistant is and his deputy, and that's not correct.

So if you want federal preemption, you take it all. There's no quick Band-Aid fix to noise.

Mr. MCMILLEN. Any other comments?

Mr. FLEMING. I would agree with Captain McNair. There is no quick Band-Aid fix.

In the airline business, there are, for all practical purposes, virtually no Stage 2 airplanes being produced. All new airplanes are essentially Stage 3. And that eventually will help alleviate the problem, and that brings one to a proposed constructive step, which would be to provide economic incentives of some sort for investment in Stage 3 technology.

Now that raises all the ominous implications about tax policy and so forth, which gets to be a very difficult issue.

Mr. MCMILLEN. Any other thoughts?

Mr. FLEMING. The one I suggest, the economic incentive, is the one that clearly would be most attractive to most operators, be they general aviation operators or airline operators.

I think, in terms of a production cutoff of Stage 2 airplanes, that's going to happen in the marketplace naturally in any event. It's folly for an airline operator to go out and invest a great deal of money in an airplane that is relatively noisier than others that are available.

Mr. MCMILLEN. Well, I appreciate your thoughts. I guess I really—the interesting thing is, I don't have a lot to take home with me. It's a sad situation, and every day there is a different human tragedy involved in this, and, you know, I understand how important the airport is, but I wish we could, you know, find some relief for these people as well.

Thank you, Mr. Chairman.

Mr. MCCURDY. I thank the gentleman from Maryland. And having been to the airport with him, I understand his concerns.

At this point, I recognize the gentleman from Kansas. I understand he just walked in. I know that if anyone has experience in this area and understands the NAS plan and some of the problems, it's the gentleman from Kansas.

Mr. GLICKMAN. I thank you, Dave, and I apologize for being late. I was involved in a meeting on product liability, which is something else.

Mr. MCCURDY. You might get some support on that one, too.

Mr. GLICKMAN. I would just ask you all—I don't think this question has been asked of you all—I wonder how you would—if I were to ask you all, is the air traffic control system safe today, I wonder how you would characterize your response to my question.

Mr. FLEMING. Mr. Glickman, Roger Fleming, Air Transport Association.

The unequivocal answer is yes. But having said that, there are also improvements that we know need to be made, and we have talked about a number of those today amongst us and pointed out a number of areas, not only in the ATC system but in related areas, where RE&D investments are required.

Mr. GLICKMAN. Okay.

Mr. SHEEHAN. Mr. Glickman, an unequivocal, yes, it is safe. But in many cases, it's terribly inefficient.

Mr. GLICKMAN. Captain McNair?

Mr. MCNAIR. ALPA's opinion is, it's safe, but we have to define "safety" a little bit, and if you're talking about exposure to risk, the exposure to risk out there is higher than it used to be, if, for no other reason, there's more airplanes out there.

So it is safe. It's not as safe as it could be or should be.

Mr. FORTIER. Yes, we certainly feel that it's safe. I flew over 300,000 miles last year, and I can assure you if it weren't safe, if I didn't feel that way, I wouldn't be up there.

I've been in several air traffic control facilities lately, and what I see taking place in the facilities, it's certainly safe. I have no question about the safety of the system.

Mr. POWER. We would share that opinion.

Mr. GLICKMAN. When we developed and moved ahead on the NAS plan and the major changes in the system, at that time I'm not sure that we had in mind the hub and spoke system that would develop as a result of deregulation.

And I just wonder if you all believe that the current development of the plan, both the hardware and software, is compatible with the changing way in which commercial aviation flies in America?

Mr. FLEMING. Yes, sir. I think that as Admiral Engen has often stated, the ultimate capacity restraint is going to be airport acceptance rates. He phrases it a little bit differently but that is in fact what he means, the limitation will be the number of airplanes that can use the runway at any given time.

At the present time, as Mr. Sheehan points out, the system has a number of inefficiencies in it, and one of the reasons we are attempting to automate that system further through the NAS Plan programs, specifically, for example, we talked about the Advance Automation System, the terminal control automation, is to elimi-

nate those inefficiencies and make maximum use of the airport capacities.

So I don't see any inconsistency there. I think what we have seen with the hub and spoke operations is increased numbers of airplanes at certain airports, O'Hare and Atlanta come immediately to mind, and everybody else would have a different example they could cite, where the airport capacity is in fact strained.

Mr. SHEEHAN. The NAS technology and plan for—the original plan, the original brown book that came out, was appropriate. It was adequate but now that we are up to 8 years behind that plan, we no longer assure that it is adequate. We feel we may have been overtaken by events, overtaken by technology.

We don't know if this is going to be appropriate. In fact, in my initial testimony, I quoted your statement of 2 years ago, that says we are going to spend $12 billion, we are going to implement all the programs, I just wonder if it is really going to work. We share that doubt.

Mr. MCNAIR. We agree that the ultimate safety valve is probably the airport system and so much of that is in the control of the local communities and there is going to have to be a compatible plan to improve airports, more concrete, to accept more airplanes, but hub and spoke lends itself to more operations and so many of our airports just don't have the capacity to take care of that hub and spoke operation.

Mr. FORTIER. One of the problems we have with the hub and spoke concept is in this free enterprise system, he who plans to hub and spoke in a certain location usually makes his announcement at the last minute. The FAA nor the Air Traffic Control System know this is liable to take place in the near future. As a result, they don't have time to gear up the necessary trained personnel and equipment to handle that increased workload.

Mr. GREENE. Yes. I think the point that both Mr. Sheehan and Captain McNair made about airport capacity—I don't know if you made that directly but I think that is clearly something that was not contemplated when we began this program. Now we could be absolutely squeezing every ounce of time out of these airports and now, of course, we are trying to see if we can reach some agreements voluntarily between the carriers to limit traffic, implying to me that no matter what we do technologically, it's going to require some old fashioned human restraint in order to reduce the utilization which of course hurts Mr. Sheehan's group because he represents a lot of folks who would like to be able to fly in to not only reliever airports but these airports as well. It concerns me.

One final question. Captain McNair, I asked is it safe and you said, it's safe but it's a question of how you define "safety," relative degrees of safety.

If I were to ask you if the system is, on a scale of 1 to 10, if the system is not as safe as maybe it was 10 years ago, why not and where not?

Mr. MCNAIR. Well, I think the mid-air collision risk is higher than it was 10 years ago. There are more airplanes in the system. You just put more airplanes in the same amount of air space and you run up the potential for collision. That's one answer to you.

There has not been the airport capacity improvements in the last 10 years. There are more people trying to taxi around these airports. There are more runway incursion incidents because of that, for instance.

Mr. GREENE. But are——

Mr. MCNAIR. Those are things that cause decrease in my level of safety and I fly the airplanes. What I am saying is if you define safety as I do, and that's exposure to risks, the exposure to risks is higher. It doesn't mean it's unsafe. I'm going to fly a trip tomorrow morning and when I sign the clearance, I'm not worried about it, okay. If I was really worried about it, I wouldn't sign the clearance.

But there are things going on and we need to admit that, in the system, that reduce those margins of safety and that's what we are here talking about today, trying to fix that, with things like TCAS III and so forth.

Mr. GREENE. Fine. Thank you very much.

Mr. MCCURDY. I thank the gentleman.

I have one last question on the NEXRAD system. As I understand it, 20 percent of NEXRAD is paid for out of the Trust Fund, the other being DOD and Commerce and Air Weather Service. As I understand it, it is finally moving. We had some problems last year on the contract. I was very much involved in that process, trying to see it move.

Is that your understanding today? Each of you seem to endorse NEXRAD. Are you aware of some problems that perhaps we are not? I think one of your comments is you would like to see an airborne version. You would like to see the wind shear. Those are things that NASA and FAA are doing jointly, but as far as NEXRAD itself.

Mr. FLEMING. Mr. Chairman, I'm quite sure all of us at this table would strongly support NEXRAD. I was not personally aware of any program difficulties and as far as I know, the cost sharing arrangement seem equitable.

Mr. MCCURDY. Well, it was a difficulty, I guess, internally, in trying to settle on the contract and the bidding process and the competition. There appeared to be some question within that. It seemed to be stretched and delayed. We had to help them move along. Occasionally, you have to do that.

We will probably have a few written questions, perhaps on a more technical level, that we will follow up with on TCAS III that Captain McNair and others raised.

We also invite you to attend tomorrow if you like. This Chairman has written to Mr. Burnley and asked that he appear and he was unable to do so, but we are going to continue to extend that invitation in the hope that the Department's representatives would convey that message, that we would very much like to have him attend. We will work around his schedule if necessary. We would like to get a positive response in the near future.

With that, we will adjourn. Thank you, ladies and gentlemen.

[Whereupon, at 3:50 p.m., the Subcommittee recessed, to reconvene at the call of the Chair.]

OVERSIGHT ON THE FEDERAL AVIATION ADMINISTRATION FISCAL YEAR 1988 RESEARCH, ENGINEERING AND DEVELOPMENT BUDGET REQUEST

WEDNESDAY, MARCH 25, 1987

HOUSE OF REPRESENTATIVES, COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY, SUBCOMMITTEE ON TRANSPORTATION, AVIATION AND MATERIALS,

Washington, DC.

The subcommittee met, pursuant to notice, at 2:15 p.m., in Room 2318, Rayburn House Office Building, the Honorable Dave McCurdy (chairman of the subcommittee) presiding.

Mr. MCCURDY. Today the Subcommittee will continue or conclude its hearing on the research programs of the Federal Aviation Administration. Our witnesses today, who are all from the FAA, will describe their requests for authorizations from the Aviation Trust Fund for fiscal year 1988 and beyond. We also want to follow up on a number of issues raised yesterday by our panel of aviation users.

I would also like to say at the outset of the hearing today that of course, the Chairman of the Subcommittee regrets the decision by the Administrator in his recent announcement about his resignation, but I understand it won't occur until July, that you will stay with us until then.

I certainly hope we can make the most of those months and you will continue to speak out and try to work with us to develop a long range plan and program to address those areas of need which you deem are most critical and also, as I said to you when we first met, we could develop a relationship that could be one of frankness and candidness and explore those areas to make changes and correct those problems, if they so arise, and at the same time to chart some plans for the future.

I know you share those thoughts and we look forward to working with you in that capacity.

I know the gentleman from Florida is not with us yet today. Admiral Engen, we can commence with your statement. You will need to pull that microphone a little closer.

STATEMENT OF ADM. DONALD D. ENGEN, FEDERAL AVIATION ADMINISTRATOR, ACCOMPANIED BY EDWIN HARRIS, ASSOCIATE ADMINISTRATOR FOR DEVELOPMENT AND LOGISTICS; MARTIN POZESKY, ACTING DEPUTY ASSOCIATE ADMINISTRATOR FOR NAS PROGRAMS; AND NEAL BLAKE, DEPUTY ASSOCIATE ADMINISTRATOR FOR ENGINEERING

Admiral ENGEN. Thank you very much, Mr. Chairman. It is indeed a pleasure to be here and we are very pleased to have the opportunity to appear before your Subcommittee.

With me on my immediate left is Mr. Edwin Harris, FAA's Associate Administrator for Development and Logistics. On my immediate right, Mr. Martin Pozesky, Acting Deputy Associate Administrator for National Airspace System Programs and on Mr. Harris' left, Mr. Neal Blake, Deputy Associate Administrator for Engineering. Later during this hearing, they will provide the Subcommittee with a more detailed presentation concerning our research, engineering and development efforts and the current status of the NAS Plan.

I would like to submit my statement for the record and just make a few informal remarks.

Mr. MCCURDY. Your statement will be admitted in its entirety and we look forward to your summary.

Admiral ENGEN. In my view, investing in research and development is very much like investing in our children. You don't see any immediate payoff. It takes time for them to develop and when they blossom, the future is really in their hands.

The basic design for any system should be planned and done years in advance and as you go to developing that system, much is not known or needs to be exploited even when that design is in progress.

There are still a lot of things that we need to determine about our National Airspace System Plan and we do have 50 percent of our research, engineering and development budget devoted to the NAS Plan at this time.

There is a need for exploring new capabilities into and out of some very congested airports. We are looking at developing fuel efficient enroute and descent transitions through forms of automation, to try to improve the timing, if you will.

We are looking towards improving detection of the long range navigation blunders that occur on PACIFIC or ATLANTIC. We need to keep looking at this to be sure that we have fuel efficiency out there and there are ways of determining where people are without respect to land-based navigation facilities.

There is a need to develop automatic ground surveillance, to warn of impending collisions on airports. We need to look at that.

We are developing a framework for satellite communications and for communication and navigation systems and we need to do this particularly where there are no ground-based systems, as I said before. We want to begin looking into what happens after the National Airspace System Plan and we are doing that. We want to identify and develop the need and meet that need now, not later on. We want research and development to support regulatory and policy initiatives that we have.

You know, we continually want to look at security, airworthiness, of course. Airmen certification; passenger protection; airport configurations are very important to the throughput of air commerce; noise; air pollution standards and cockpit configurations, because I think perhaps one of the greatest improvements that we are going to be able to make in aviation safety in the future is going to be working in the field of human factors, to see why people make mistakes, why a pilot makes a decision to fly into a dark cloud, if you will, or what led him to do that, or made an air traffic controller make a repetitive mistake.

Human engineering and human factors, I think, are just going to be vital to future safety. I hope that we will put a great deal of emphasis on this.

We want to identify and apply emerging technology and we want to use it as we move along.

Six months ago or thereabouts, a few months ago, I established an Office of Science and Advanced Technology. It's a very small office. It is to look at long range technical issues. There will be no more than about 25 people in this office. It is to build the lines of communications with other Government agencies, DARPA, DOD, NASA, the SDI. We need cooperative development in the Government. It's my goal in establishing this office, which is basically not funded in our current budget and will be in our 1989 budget, but we need to establish this office first, but I want them to look out there and help this cooperative development and find out what other people are doing so we in the FAA can capitalize on that technology.

We need to cut costs, of course. NASA, GPS, the SDI, are doing some very interesting things that will have some civil applications, civil aviation applications.

We want to take a systems approach to what happens after the year 2010. We want to look at the kinds of vehicles that are going to be flying out there, the tilt wing rotors, hover craft, transatmospheric airplanes or vehicles. We want to look at what kind of separation is going to be provided to people. Are we going to have direct or indirect control? Are we going to use GPS? Are we going to use automatic surveillance? We want to look at light weight components, especially for our space technology, that we can shift into the cockpit.

I think we have a perfect opportunity now to develop technology in miniaturization that can be carried in the cockpit. We have to be careful though that we do this across the board for aviation. We don't want to just think about the high end of aviation. We have to think about the low end of general aviation.

It was for that reason that we developed filling the mid-continent gap for Loran-C.

By the same token, you have to start someplace and it has been my experience in my years as a test pilot in research and development that you start with a very sophisticated system first and then you come down, let it trickle down into the organization.

I view research and development as vital to our future. We shouldn't throw dollars at research and development because I think that's wasteful but we must invest in the future.

Now, $150 million that we have in our 1988 budget is roughly 2.5 percent of our total budget. Eastman Kodak spends about 10 percent of its sales on research and development. IBM spends about 8 percent of its sales on research and development. My view is that we need to increase our research and development spending in the future but this needs to be done with reason. I want to stand by my budget submission of $150 million. We have to continue to do better with less but as we move into the future now, we are going to need to place more emphasis upon research and development, and we are going to have to do that through adding more money.

In closing, Mr. Chairman, I would just like to thank this Committee for its many contributions to aviation safety. The FAA and this Subcommittee have had a long standing cooperative working relationship, which has fostered the obtainment of many important aviation objectives and we look forward to maintaining that same spirit of cooperation with this Subcommittee as we work to improve our nation's air transportation system.

I would be pleased to respond to any questions you might have at this time, after which I would ask Messrs. Harris, Pozesky and Blake to provide a detailed presentation of our research and development plans. We are prepared to do that, sir.

[The prepared statement of Admiral Engen follows:]

STATEMENT OF THE HONORABLE DONALD D. ENGEN, FEDERAL AVIATION ADMINISTRATOR, BEFORE THE HOUSE COMMITTEE ON SCIENCE AND TECHNOLOGY, SUBCOMMITTEE ON TRANSPORTATION, AVIATION, AND MATERIALS, CONCERNING THE FAA'S RESEARCH, ENGINEERING, AND DEVELOPMENT PROGRAM FOR FY 1988. MARCH 25, 1987.

Mr. Chairman and Members of the Subcommittee:

I am pleased to have the opportunity to appear before the Subcommittee today to discuss the FAA's Research, Engineering, and Development Program. With me are Edwin Harris, FAA's Associate Administrator for Development and Logistics; Martin Pozesky, Acting Deputy Associate Administrator for NAS Programs; and Neal Blake, Deputy Associate Administrator for Engineering. Later during this hearing, they will provide the Subcommittee with a more detailed presentation concerning our R,E&D efforts and the current status of the NAS Plan.

As this Subcommittee is aware, an R,E&D program that is well planned, properly executed, and adequately funded is vital to the advancement of aviation safety. Over time, the FAA's R,E&D program has developed many important products which have demonstrably enhanced the safety afforded the travelling public. Aviation has presented dynamic challenges in the past. As we have met those challenges, new challenges have arisen. We continue to face challenges in the current air transportation system, and yet must look ahead to meet future demands that will be placed on the agency's services. For example, weather continues to be a

significant factor in aviation: the broad rivers of air in the troposphere still present challenges of detection and understanding: and terminal areas may experience periods of reduced visibility, windshear, and freezing precipitation. The troubled world situation requires additional research efforts to further improve the security of our air transportation system from terrorist threats. Moreover, the continued increases we are experiencing in air traffic levels mean that we must continue to improve system capacity while striving to reduce the threat of midair collisions. The balanced R,E&D program we are pursuing is designed to meet those challenges and others in a positive and methodical way.

Over the next 2 to 5 years, the majority of the FAA's R,E&D activities will enhance and improve the NAS Plan efforts to totally modernize our air traffic control system. We are also looking now for our R,E&D activities to focus on new initiatives that build upon the foundation laid by the NAS Plan.

One of the major research and development initiatives that supports our NAS Plan activities is the development of the Advanced Automation System (AAS). The Advanced Automation System is the cornerstone of the NAS Plan. In addition to increasing system capacity, the higher levels of automation introduced through the AAS will allow more reliable and safer services to the users of the National Airspace System. AAS features such products

as new controller work stations with state-of-the-art color displays, a new distributed computer network with architecture designed for technology insertion and capacity expansion, and new software that will require up to 1.5 million lines of code. The bulk of the AAS program's costs have shifted from research and development to the FAA capital equipment program, but we continue to need funds for engineering personnel salaries and other related costs as well as resources to operate our advanced automation support laboratories at the FAA Technical Center.

We also are continuing vital work on an advanced system concept called Automated En Route Air Traffic Control--AERA-3 for short. AERA-3 will significantly increase controller productivity and user flexibility by introducing advanced ATC automation to relieve controllers of many of their tactical control tasks, giving them more time to manage the system strategically .

We are developing a Voice Switching and Control System (VSCS) to perform the intercom, interphone, and air-to-ground communication and control functions needed for air traffic control operations. The VSCS will use "off-the-shelf" technology, adapted to meet FAA requirements. Two competing designs will be evaluated prior to the development of final specifications and award of the production contract. Prototype development, as well as testing and evaluation, will be conducted under two prototype development contracts awarded in October 1986.

We are working to improve the transfer of air to ground digital data by means of the integral data link capability of Mode S. Mode S provides accurate data transmission capability for aircraft position, weather products, and ATC communications. Mode S provides the data link applications necessary to realize many of the NAS Plan's benefits in controller and flightcrew productivity.

As I mentioned earlier, hazardous weather is a significant threat to the safety of flight for all aircraft, particularly in the critical takeoff and landing phases. A central objective of the NAS Plan is to reduce the risk of weather-related accidents. Our research and development efforts support this objective. Our R,E&D budget for FY 1988, for example, devotes over $18 million to weather-related programs.

We are developing a central weather processor to improve the collection, processing, and dissemination of significant weather information. The development of the prototype and its software will continue through FY 1988. I expect it to be delivered to the FAA Technical Center for test and evaluation in FY 1989.

In addition, the FAA is participating jointly with the Department of Defense and the Department of Commerce in the development of a common-use Next Generation Weather Radar--NEXRAD--to probe weather fronts and provide information on interior storm circulation for

en route applications. We also are developing a Terminal Doppler Weather Radar (TDWR) System that will detect microbursts and wind shear. This radar will be located on or near an airport's operating areas, and will afford a high degree of additional protection to system users.

Both of these programs have matured to the point where the basic research is almost complete and the systems are moving into the production phase. The remaining research and development tasks consist primarily of software enhancements and the development of advanced algorithms to enhance weather products.

The activities I have described so far constitute only the significant research and development activities that directly support our National Airspace System Plan, amounting to just over 50 percent of our total budget for FY 1988. While the NAS Plan does account for many of our "big ticket" research projects, we must also press on with other critical research programs to increase capacity and improve safety.

The FY 88 budget includes advanced concept studies which concentrate on definition of the operating environment in year 2010 and the nature and magnitude of the demand for NAS services. It includes a study to evaluate alternative methods of air traffic control and alternative approaches to meeting future communications, navigation, and surveillance (CNS) needs. In

structuring this program, the FAA was guided by the future system CNS requirements identified by the Radio Technical Commission for Aeronautics, Special Committee 155.

The FAA and the aviation industry have identified a number of concepts that may increase airport capacity, improve safety, and reduce delays. The most promising of these--independent approaches to dual runways with 3,000 feet centerline spacing--was studied in FY 1987. Using the results of this study, a landing monitor concept will be selected and development started in FY 1988 for these types of runways. Work will also begin on defining and selecting other promising concepts for independent instrument flight rule approaches to other site-specific runway configurations.

The capacity of the ATC System depends to a large extent on the standards used to ensure safe separation of air traffic. The FAA will continue to analyze and validate the current U.S. and international airspace separation standards and as capability increases to develop information that can lead to new standards of separation.

Other capacity improvement initiatives include the development of a concept for an Advanced Traffic Management System that will efficiently allocate traffic demand to available system capacity, and an Automatic Dependent Surveillance System to improve the

monitoring and control of aircraft over oceanic airspace. Another research study explores air traffic control concepts to accommodate user-selected approach paths. We should look ahead to alternate means of geopositioning accuracy and traffic control.

Two of our research projects address the problem of runway incursion incidents. We are developing improved automation tools to alert the controller of potential conflicts on airport surfaces, and we are exploring enhancements to the Airport Surface Detection radar to provide automatic radar tracking and target classification.

To further reduce the threat of midair collisions, we have developed the Traffic Alert and Collision Avoidance System (TCAS). TCAS will provide collision avoidance protection against all aircraft equipped with the existing ATC Radar Beacon System transponder. This transponder is carried by all commercial aircraft and 65 percent of all general aviation aircraft in the United States. TCAS-II is being implemented now. TCAS-II provides traffic advisories to pilots as well as ascend or descend instructions. A prototype TCAS II unit has been certified for use in a Piedmont B-727, and Piedmont has now flown its first revenue flight using such a TCAS unit. Fourteen additional commercial quality TCAS units are in production. These TCAS units will be flown on United, Piedmont, and Northwest Airlines' aircraft beginning in mid-1987. I plan to issue later this year a Notice

of Proposed Rulemaking which would require the installation of TCAS II on airline aircraft.

We are completing the remaining development efforts on TCAS-III (which will provide left and right turn instructions to pilots in addition to ascend or descend instructions) and to demonstrate its capability in FAA aircraft. Our FY 1988 R,E&D Program level provides funds to complete these activities.

A comprehensive new Wind Shear Training Program for pilots was formally delivered to the FAA on February 26, 1987. This program, developed by an industry team headed by the Boeing Company under a $1.8 million FAA contract, is part of an integrated FAA effort to counter the threat of low level wind shear. We will continue this valuable work in FY 1988 and will also pursue the development of a low-cost, ground-based laser wind shear sensor for use at airports where Doppler radars are not cost effective.

In the area of civil aviation medicine, our programs provide research and support to the Federal Air Surgeon with respect to aeromedical certification and standards, medical accident investigations, health and aeromedical education studies. Through our laboratories at the Mike Monroney Aeronautical Center, we are continuing research into survival measures following aircraft accidents. Our Oklahoma City facility also will continue its important work on the effects of various factors such as altitude,

age, vision, and stress on human performance. The challenge for aviation safety in the future will be to address human factors, both on the ground and in the air.

Fire continues to pose a potential threat to air safety. Historically, 39 percent of fatalities in survivable accidents have been fire-related. Therefore, in past years, most of our research in this area has focused on postcrash fires. As an outgrowth of those efforts, we have issued more stringent Federal Aviation Regulations mandating heat resistant evacuation slides, and we developed and promulgated regulatory standards governing seat cushion flammability, emergency lighting, fire extinguishers, cargo compartment fire protection, and cabin panel flammability. This work will continue, but our main thrust over the next several years will be directed more toward in-flight fire safety.

Criminal acts of sabotage and hijacking continue to pose a serious threat to civil aviation throughout the world. To counter this threat, the FAA has initiated studies on advanced weapons and explosive detection concepts and technology. We also have undertaken a program to upgrade the performance of the current airport concourse screening systems. Studies on improved approaches to detect plastic and composite weapons concealed on people have just begun, while those on improving current systems will yield results in the next year. The development of a prototype explosive vapor detection system to screen people is

well underway, with initial airport testing planned for mid-1988. A study utilizing vapor detection systems for screening passenger carryon luggage is also underway.

Many other equally important initiatives are underway. Together with the international aviation community, we are defining what the future navigation system should be, and we are studying how to modernize our present generation of navigational aids. We are assessing the special needs of tilt rotor aircraft. Last year, the FAA, jointly with NASA and the Department of Defense, awarded a contract to Boeing to examine the feasibility of using the tilt rotor aircraft in civil applications. The study will examine civil airworthiness, flight operations, airport considerations, and air traffic control requirements.

We are also examining how to use the low altitude airspace more efficiently. We are assessing hazardous operational and physical features of airports, including bird and wildlife hazards, and reviewing airport configurations and design. We are conducting research for improved firefighting agents, equipment, and procedures. We are developing ground performance advisory systems to provide information on takeoff acceleration, braking during landing, and turnoff speeds when there is water, snow, or ice on the runways. Our work ranges from human factors research studies for controllers and flightcrews to the potential application of satellite technology in the ATC System.

To fund these important initiatives, the reauthorization legislation currently before the Congress seeks $150 million in both fiscal years 1988 and 1989 for research and development programs. Enactment of the levels of funding in the proposed Airport and Airway Enhancement Act of 1987 will help ensure that the FAA's important R,E&D programs will go forward. In that regard, we would welcome the support and assistance of this Subcommittee in working toward the enactment of those authorization levels.

In closing, Mr. Chairman, I would like to thank this Subcommittee for its many contributions to aviation safety. The FAA and this Subcommittee have had a longstanding, cooperative working relationship, which has fostered the attainment of many important aviation objectives. We look forward to maintaining that same spirit of cooperation with this Subcommittee as we work to improve our Nation's air transportation system.

That completes my prepared statement. I would be pleased to respond to questions you may have at this time, after which Messrs. Harris, Pozesky, and Blake will provide a more detailed presentation of our R,E&D programs.

Mr. MCCURDY. Okay. Do they actually have statements that want to present?

Admiral ENGEN. We have a briefing which would—I feel could be illuminative, by Mr. Harris and Mr. Pozesky and Mr. Blake.

Mr. MCCURDY. Why don't we proceed with that then and as soon as that is finished, then we will go with questions.

Admiral ENGEN. Okay. I might add in passing the lead to Mr. Harris here, that Mr. Harris, Mr. Pozesky and I recently met with the ten industry representatives that represent the major contributors to the National Airspace System Plan. We had the CEO's in to talk to them about our goals in the NAS Plan, where we are going, what we see, what the problems are and much of what they will say will be that which we said to these CEO's when we had them in three weeks ago.

Mr. MCCURDY. Very good. Why don't we proceed with that? Yesterday we had a very interesting hearing from the users and a number of questions were raised about specific systems and questions about the NAS Plan, and I think that with your briefing, we may get into that level of detail, and then we will come back to you, Admiral, at that point.

Admiral ENGEN. We will commit to keeping it brief.

Mr. MCCURDY. I appreciate that. Thank you. Mr. Harris?

Mr. HARRIS. Mr. Chairman, it is a pleasure to be here. What we would like to do, is I will present a broad overview and Mr. Pozesky a more detailed overview of the NAS Plan, with Mr. Blake getting much more detailed in the R&D program.

In December of 1981, FAA developed a comprehensive National Airspace System Plan and that plan was basically a concept to move the agency from the days of the vacuum tube into modern technology, and to give us the capability of building enhancements into the system to improve capacity, user productivity, safety and also controller productivity.

The goals of the NAS Plan are pretty clearly defined: to develop and manage a system to handle the increasing demand; to meet the need for fuel efficient routings; to reduce operational errors by 80 percent; enhance safety in terms of reducing risk; and improve air traffic controller productivity; and in the maintenance area, capping our costs and staffing requirements in maintenance based on the '80 levels and reducing overall staffing requirements by 33 percent.

The Trust Fund legislation for the first five years of the NAS Plan total $6.3 billion which is funded entirely from the Airport and Airway Trust Fund. The appropriations during that same period were approximately $1.6 billion below the authorized level for that five year period.

We accommodated the reductions through a series of management actions and these include deferring projects, coming off full funding in some cases, awarding contracts in October in lieu of September, and in addition, quite frankly, we had overly optimistic schedules in terms of the projects. All of these things helped to minimize the impact of the funding.

The key point I would like to make here is that in the next two years in the NAS Plan, funding is becoming critical, because the NAS Plan is moving into that phase where the projects are moving

into deliverables. Over 50 percent of the NAS Plan projects will be in some form of deliverable prototype, test and evaluation, or field delivery, and at that time, we lose our flexibility to handle budgetary cuts when we are in a production line mode.

The overall cost for the NAS Plan for the first ten years, 1982 to 1992, was $12.2 billion. This ties back to the original figure of $11.7 billion. Terminal Doppler Radar was added for $0.5 which brought it to $12.2.

There are some seven projects that go beyond 1992, MLS being one of the large ones, advanced automation system, ACF, these were always known. The original ten year period was taken as the time to basically get the base system in place.

This is just a visual portrayal of some of the benefit streams from the improved system. Many of them come in toward the tail end of the system. The overall user benefit is $37.4 billion. FAA benefits in terms of $26.2 billion, for a total of approximately $63.6 billion in benefits from the overall NAS Plan.

In February of 1983, the White House Science Council Panel concluded that the NAS Plan would require sustained technical and managerial capability of the highest quality and recommended use of a single private contractor charged with formulation, design and system integration of the entire ATC system. The major areas of work were to be in contract administration, program management support, system level engineering and integration and project engineering support and implementation planning.

This was the original ten year contract value, $68.4 million, contract mods subsequently added $211 million to the ten year contract. The SEI contractor provides increased support to the advanced automation system; earlier technical support to some NAS projects, which we will speak to in more detail; and accelerated support to the regions as we move into the implementation phase.

Total staff will average 1,090 people in FY 1987.

There has been no question there have been slippages in the NAS Plan. Projects are behind schedule. There is a list of some 11 major NAS programs with schedule slippages and the reasons for them. The reasons vary. I mentioned one earlier, over optimistic schedules.

Mr. McCURDY. Mr. Harris, at that point, could I—are those provided in the record? Do you have a list of those 11?

Mr. HARRIS. Yes. They will be provided.

[Information to be furnished follows:]

Status of Major NAS Plan Projects

MSA Project	Amount of Slippage in Initial Implementation Comparison 1983 NAS Plan with Draft 1987 Plan	Reason for Slip
HOST	6 Months	Contractor delays in software coding and documentation.
AAS	2 Years	Additional requirements added (color/AERA) and provision for pre-production testing.
VSCS	1 Year	Additional requirements (number of operational positions, redundancy) and testing to reduce risk.
FSAS	2 Years	Software development problems.
AWOS	2 Years	Contractor difficulty complying with Critical Design Review requirements and failure to perform required quality assurance procedures.
CWP	3 Years	Addition of prototype phase, redefinition of statement of work with contractor (NASA/JPL), less than optimum contractor staffing.
Long Range Radar (ARSR-4/FARR)	4 Years	Delay in consummating FAA/USAF agreement on number of systems required and funding.
MODE-S	4 Years	Prototype added, clarification of specifications, revised test plan, contractor late meeting critical design review.

Status of Major NAS Plan Projects (Cont.)

MSA Project	Amount of Slippage in Initial Implementation Comparison 1983 NAS Plan with Draft 1987 Plan	Reason for Slip
ASR-9	3 Years	Delay in completion of critical design review, problems in system integration testing, FAA rejection of inadequate test procedures, contractor problem obtaining critical parts.
MLS	2 Years	Delay in contractor software coding; changes of deployment location/runway; delay in receipt of valid frequency assignments.
RML	1 Year	Implementation started in 1986.
TDWR (New project in 1986 plan)	1 Year	Revision of draft project specification; evaluation of impact of various siting options

Mr. HARRIS. The list is attached to this statement. Many of the programs encountered difficulty in software development. This is an universal problem being experienced throughout the industry, DOD and NASA included.

Nonetheless, we are turning the curve in terms of battling our way through the problems. We are making progress. As you will see a little further on, I think the progress is significant. The momentum is building up in the NAS Plan as we move into the implementation phase and that's one of the reasons that the funding for 1988 and 1989 become so critical.

As part of Administrator Engen's concern with the slippages in the schedule, last year he appointed a group not associated with the NAS Plan to come up and take a look at the mid-course progress of the NAS Plan. This group identified a number of items in terms of this mid-course assessment and we termed it the mid-course adjustments.

Number one was to appoint a NAS Program Director with exclusive responsibilities for the NAS Plan to more clearly focus managerial responsibility and attention on the NAS Program.

Martin Pozesky is Acting Deputy Associate for NAS Programs, and although he reports directly to me, he also has direct access to Administrator Engen.

The assessment of the role of the systems engineering and integration contractor was identified and from that, as we move into the implementation phase, some actions have been implemented to build up the contractor's role and assistance in that phase of the program.

We are looking at establishing a more complete planning process that considers the impact upon our people both in terms of training, staffing and what not, as the NAS Plan is implemented.

We are also providing formal training to our NAS Project managers in terms of contractor/project manager relations, schedule control and overall management.

We are also looking at promoting awareness of the NAS Plan achievements as we move into the implementation phase of the program.

In the R&D program area, for the past few years, as the Administrator mentioned, much of our effort has been directed toward the NAS Program. That has been slowly drawing down as we get further into the NAS implementation phase and we are seeing a shift in R&D to what I would call post-NAS requirements, those coming in after the 1992 and on out to 2010.

The FY 1988 program of $150 million and 1989 program of $150 million is identified in the legislative package.

Major progress has been made in the first five years. The momentum is growing as we move into the implementation phase. The mid-course adjustments that have been made based upon the Agency review, I think, will contribute significantly to bringing schedules more in line and to our ability to stay more on schedule moving into the last five years of the program.

The program remains cost beneficial. We have had a couple of independent looks at it outside of the NAS people and it is still cost beneficial.

The next two years include the critical implementation phase and the production contracts for the remaining major acquisitions. As I mentioned earlier, the recommended funding level for authorizing legislation for the next two years is critical to the NAS Plan, as we move into production lines, we do not have the flexibility to adjust dollars without impacting schedules.

The R&D proposed authorization continues to support NAS Plan but is shifting more and more towards future initiatives.

That concludes my statement, Mr. Chairman. I'd like to turn it over to Mr. Pozesky.

[Information to be furnished follows:]

National Airspace System (NAS) Plan Overview

March 25, 1987

NAS Plan Overview

- A Comprehensive Plan for Modernizing and Improving Air Traffic Control and Airway Facilities Services Through the Year 2000
- First Published in December 1981
  --Plan Is Updated Annually
- Plan Is Directly Linked to the Funding Authorizations in the Airport and Airway Improvement Act of 1982

NAS Plan — Goals

- Develop and Manage a System to Handle the Increasing Demand
- Design the System to Provide Fuel-efficient Routings and Minimize Constraints to Users
- Reduce Operational Errors by 80%
- Reduce the Risk of Accidents
- Double Air Traffic Controller Productivity
- Reduce Maintenance and Technical Operations Staff by 33%
- Cap Maintenance Costs at 1980 Levels

NAS Plan — Financial

- Trust Fund Legislation:
  - Airport and Airway Improvement Act of 1982
    - -- Authorized $6.327B for First 5 Years of the ATC System Modernization as Described in the NAS Plan Dated December 1981
    - — Required Annual Update of NAS Plan to Reflect Progress and Changes in Requirements
  - Appropriations for FY 1982-1987 Totalled $4.662B
  - Success of Next 2 Years of the NAS Plan Is Linked Directly to the Funding Authorizations for FY 1988-1989 and the Annual Appropriations

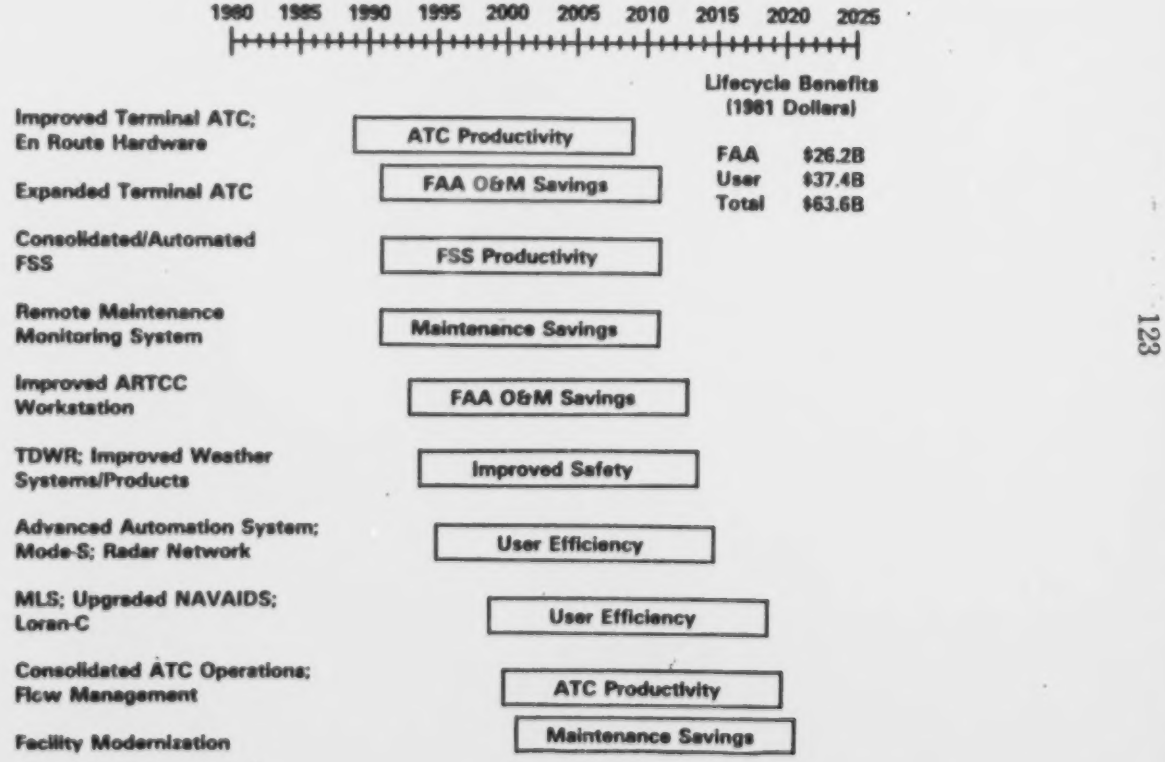
NAS Plan Funding Requirements (FY82-92)

1987	NAS Plan Cost (FY 1982 - FY 1992)	$12.2B

- $1.35 Billion Requested in FY 1988
- $1.50 Billion Requested in FY 1989*

* Additional $200M Risk May Be Required in FY 1989

NAS Plan - Benefit Streams



SEI Contract—Overview

- Awarded January 31, 1984, to Martin Marietta
- Supports FAA in NAS Plan Implementation
  - Top Level NAS Program Management Support
  - System Level Engineering and Integration Support
  - Project Management Support
  - Implementation Engineering Support
- Cost Plus Award Fee
  - Fee Awarded Each 6 Months
  - Based on SEI Performance and Achievement of NAS Plan Objectives

NAS Plan Mid-Course Adjustments

- Appoint a NAS Program Director With Exclusive Responsibilities for the NAS Plan
- Assess the Role of the Systems Engineering and Integration Contractor
- Establish Planning Process That Considers Human Resource Needs
- Provide Formal Training of NAS Project Managers
- Promote Awareness of NAS Plan Achievements

RE&D FUNDING REQUIREMENTS (FY-1988/FY-1989)*

FY-1988	$150M
FY-1989	$150M

*Requested Legislative Package

SUMMARY

- Major Progress Has Been Made in First 5 Years of the NAS Plan
- Mid-Course Adjustments Made Based on Agency Review
- Program Remains Cost-Beneficial
- Next 2 Years Include
  - --Critical Implementation Phase for Most Projects
  - --Production Contracts for Remaining Major Acquisitions
- Recommended Funding Level for Authorizing Legislations for Next 2 Years Is Critical to NAS Plan Success
- RE&D Proposed Authorization Supports NAS Plan and Future Initiatives

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RML	1 Year	Implementation started in 1986.
TDWR (New project in 1986 plan)	1 Year	Revision of draft project specification; evaluation of impact of various siting options

Mr. POZESKY. Thank you, Mr. Chairman and members of the committee.

I would like to take us through the NAS Plan and provide a thumbnail status. We will try to do it quickly, but there are a lot of elements to discuss.

The first thing I would like to make is a statement which very clearly indicates that there has been a very substantial amount of progress in the NAS Plan. The NAS Plan consists of 88 projects, or did consist of 88 projects. Twelve of them are now completed. Roughly 47 percent of all the individual programs and projects have begun implementation. Over 4400 pieces of equipment have been delivered to the field. About 100 pieces of equipment a month from here on in for the next five to six years will be fielded as a result of the plan.

Some of the major programs have had slippages, and we will talk about them, but in terms of the overall effectiveness of the program, there still are many deliveries and many rewards and many programs to be accomplished. Seventy percent of the major programs are under contract. By the end of this fiscal year about 90 percent of them will be under contract. Currently, as the Vu-graph indicates, about 75 percent have been awarded.

Mr. MCCURDY. If I could interrupt you there, I just wanted to ask about the contracts. We talk about the number of projects and the contract, and of course, you have a systems integrator, but as I understand it, there is not a prime that is directly responsible for the entire system. In other words, FAA is——

Mr. POZESKY. FAA is responsible. If I might elaborate, there has been a perception that Martin Marietta, as a systems integrator, somehow or another had prime contract responsibility in the formal sense of a prime for the NAS Plan. That is not true.

Mr. MCCURDY. I understand that, and that raises the point of, if you as an agency are, in effect, contracting on each of these projects, then are the contracts very similar as far as the type of contract? Are they cost plus, are they fixed fee? What are the types of contracts? And what type of leverage do you have over the contractor as far as performance and cost and schedule, and if you had a prime contractor, would you not have greater leverage over that company or that contractor in forcing compliance?

How do you do it, and explain. You say 90 percent, 75 percent are awarded. I think we need some more detail on the actual contract because that has been raised before, and in my experience in the Armed Services Committee, this is always a bone of contention, and I think we need to lay it out here.

Mr. POZESKY. Okay. Let me try to start the answer, and maybe we can ask Mr. Harris, or the Administrator, to chime in. I guess the first thing to say is that we do, indeed, let all of these contracts ourselves through our contracting process internally in FAA and OST, and all the contracts with the vendors are with the FAA. Martin Marietta in many regards has what is called an agreement with the prime to get data, to work with them, to share their information, but the formal project direction comes through the FAA.

The type of contracting? There is not a single, unique type of contracting in the NAS Plan. We have fixed price contracts, we have cost plus, we have award fee contracts, we have cost plus

award fee. We have every variety, many varieties. There are a couple we do not have which I think are characteristic of the military, such as leader/follower type of contracting arrangements. We do not have those.

The leverage over the contractors, there is no single answer to that. We have seen good performance by contractors on cost plus contracts. We have seen poor performance on cost plus contracts. In terms of our correlation to the type of contract, I would say that there has been very little of a theme. There are some opinions, and I can certainly give you some of mine on that issue, and there are still many, many controversies.

We have had contracts where the hardware is fixed price and the software for the same system is cost plus. That is an example of two or three of our major contracts that we have had like that. My view of that and in working with the contracts department is that it almost provides an incentive to grow the cost plus part of the contract and keep the fixed price part of the contract level, so that has been a satisfactory and effective way of contracting in some programs, and in others it has not.

I can go through all 88 programs, and they really are very different kinds of contracts.

Mr. McCURDY. That raises a question. If you have 88 different types of contracts or different projects and you have so many different types of contracts, what is the criteria that you are using to develop these contracts? How many are dual sourced? How many are sole sourced? I know they are usually based on competition. I am sure they all are, but what type of competition do you have built in to the system? How many are you prototyping on? What are your largest ones?

That sounds to me that with an agency that may not have all the capabilities that DOD and others have—and DOD is not the shining example we are always going to be pointing to. I am just telling you that from my experiences, that there are some contracts you need to avoid and some that are better than others.

Admiral ENGEN. Let me try it, Mr. Chairman, for a second if I could. We have, as Mr. Pozesky says, all kinds of contracts. Some are designed to be cost plus fixed fee, some are not. That was a value judgment at the time on trying to get the most out of that particular contract. For instance, on software, I think the development of software is a big question mark in a lot of people's minds, and you want one kind of contract for software as opposed to a different kind of a contract for an MLS.

So what we have tried to do is tried to fit the kind of contract to the contract itself. I want to assure you that the fact that we have different kinds of contracts ought not to indicate that we are out of control, because we are not. It was done intentionally that way to provide a broad variance, if you will, of different contracts out there for different reasons.

Mr. McCURDY. I understand, Admiral, but it is one thing if you are telling me that for software contracts—which you have a tremendous amount of software here, and I understand that, and those are very big hurdles sometimes in any development—that you treat those different, but are you also telling me that your hardware contracts are generally the same type?

I mean what is the basis? Who makes the decision? Is it a contract officer somewhere in the basement of the building who says, well, I happen to like this particular type of contract, or who makes the decision and establishes the criteria of which one it is? Do you try to get a firm fixed fee first, and if you can't get that, you go to the award plus? Tell me how you do it?

Mr. POZESKY. Let me just describe the process. When a particular program is up for contracting, the technical folks, and the contract folks sit down and try to fit the program, its software content, its hardware content, its technical risk, to the type of contracting. We literally try to tailor the contract structure to the type of program that we have.

Where we have a program that we judge to be primarily hardware, with little technical risk, we as a general rule lean more in the direction of fixed price or fixed price incentive-type contracting. The ASR9 radar with Westinghouse is a fixed price contract, where you have programs that have very substantial software content, where there is judged to be software risk, we lean more to the cost-plus type contracting, and it is a one-by-one decision.

That recommendation is reviewed by the procurement people, by the Administrator, and depending upon the size of the contract, it goes to the Office of the Secretary for review in both structure and purpose.

We go through a very formal process of soliciting. We have a process which we call TSARC, and it is we go out, and virtually all of these programs are competitively awarded. There are some exceptions, but clearly most of the awards are fully competitive. We go through a formal source evaluation board, independent analysis. The major programs are reviewed by the Administrator, the Associate Administrator and the Office of the Secretary. Our largest programs, the Office of the Secretary is the source selection official.

Each one of these things goes through a very unique and individual approach.

Mr. MCCURDY. I appreciate that, and that clarifies it.

Have you had any contracts canceled? Have you penalized any contractor? Have you revoked any contract for failure of performance or bad performance?

Mr. POZESKY. Yes, sir. The answer to all of those is yes. We have had contracts canceled for poor performance. The thing that comes to mind immediately is about three or four years ago that we had a program for some of our weather sensors that was cancelled for poor performance. We have a contract now that we are considering moving with, and I really would rather talk to you privately about that because I don't think that it is public.

We have a contract that we have had penalties on, the microwave landing systems, where the contractor is currently incurring penalties for late delivery. We have done that.

We have begun more and more to bring top management pressure, attention on the part of our top management as well as the private sector's top management, on FAA programs. The CEO meeting that the Administrator just talked about was an effort to make sure that the presidents, vice presidents and CEOs of these major corporations paid attention to the programs that they have and paid attention to FAA as a major customer.

We have seen that help. We have seen the management visibility that that brings on the project and program manager executing the program to be a very, very real asset to us and we intend to continue to operate in that fashion.

What we have in the remainder of the briefing is we are just trying to go through some of the individual projects and programs, so why don't we interrupt as we go along.

The next thing on the agenda is a Vu-graph which talks about the host computer. As you probably know, this is a fundamental program to us. This is the replacement of the existing 20-year old so-called IBM 9020 computers that comprise our en route air traffic control system. The contract was competitively awarded, and let me just digress a minute. I will try to describe the contracting structure as we go through here.

This was a contract which we had originally awarded to two vendors, competitive run-off. After a design competition phase, one vendor was competitively selected to continue into production. IBM won the production contract here. It was awarded in July. The first system has been delivered to Seattle, the second and third systems to Houston and Denver as well. They are undergoing operational readiness demonstration. We hope to be operational with the first system in May of this year.

We will be delivering at the rate of about two per month for the remainder of this year, and hopefully by late 1988 we will have commissioned all the systems, although the Vu-graph says early 1989. We are targeting internally for late 1988 to try to get that job done.

Again, one of our most important programs currently coming on line, a program which did suffer from initial software delays but we have battled our way through it and we are very, very hopeful about this.

A second program, another key element of our automation system is our advanced automation program. This program itself has been the subject of a great deal of interest from purely the question of acquisition strategy.

Mr. MCCURDY. Mr. Pozesky, I want to ask you a question on that. On the host contract, on the host computer, what was the schedule? You said you had problems on it. How much delay was there?

Mr. POZESKY. Six months.

Mr. MCCURDY. Six months.

Mr. POZESKY. A six-month delay for the initial delivery after testing, and due primarily to the software problems in rehosting the software.

Mr. MCCURDY. So that was not a significant—I mean it was within some tolerable limits, within the noise level.

Mr. POZESKY. We believe so.

Mr. MCCURDY. Who was the contractor on that?

Mr. POZESKY. IBM, Federal Systems Division in Gaithersburg.

Mr. MCCURDY. Thank you.

Mr. POZESKY. The second program is a program which, as I said, has been the subject of a lot of discussion. In terms of acquisition strategies, it is a program to build, if you will, the computer infrastructure for the new air traffic control system, both en route terminal and en route systems. It is a major program to provide new

color displays to the controller and then to evolve the software and hardware to the future air traffic control system.

It is currently in the design competition phase. There are two substantial industry teams developing this for us, a team headed by IBM, another team headed by Hughes. We are into that program. The program did have software design delays.

We have been discussing with Congress, with the subcommittees the desire on the part of Congress to have additional testing before the production decision is made. We are currently in receipt of a letter from both the House and the Senate on that issue. We have been talking with the staffs now for, I guess, six to nine months on that issue, and we owe the Congress a letter responding to their latest technical direction, which we would estimate, to provide the additional testing and the additional controls that they desire, would add 8 to 12 months to the current projections for the AAS program.

That is still very much one of our central programs in the next four to five years in the NAS Plan and is one in which, as I say, we are currently in the design competition phase.

Mr. McCURDY. Are the testing requirements imposed by the Appropriations Subcommittee because of the software problems or just general slippage or what? What is their concern?

Mr. POZESKY. Their concern is one of premature commitment to a design before all facets of the design are visible and are shaken down. I think that is their most fundamental concern. It is an A109 kind of concern, trying to avoid premature commitment. I don't know that I would label it as any single——

Mr. McCURDY. Do you agree?

Mr. POZESKY. I agree that the program—that we need to get to a point where the testing is adequate. Earlier there was a proposal to take both development programs through four to five to six years of development before the downselect decision was made and have each contractor develop over a million lines of code in the competitive environment. We did not agree with that strategy. We have proposed to the committees—I would characterize it as a unique strategy and one in which we separate the production decision from the downselect decision.

That strategy is born from a belief on our part that we need to ensure that the selected contractor has the technical base and the technical capability and the proper system architecture that will get us there, but we need to get in a hands-on mode with that contractor early to help mature that software. That is our fundamental belief.

We have worked with the GAO and very close with the committees on that. I hate to label our situation as to whether they agree with us. I would say that they are still skeptical, but I think we are much closer to an agreement on this issue than we were six or nine months ago.

Mr. McCURDY. Very good.

Mr. POZESKY. A major element of that program is the en route automated air traffic control system, which is AERA, which comes in three phases, one, two and three. One is part of the initial development, two will be developing in parallel with the basic hardware and software, and three is a long-term program which Mr. Blake

will be describing as part of our R&D program. But these are the major software packages that will bring the productivity and capacity benefits we are talking about—another element of this program is a voice switching and control system.

Mr. MCCURDY. First, on your AERA, how much delay is experience on this one?

Mr. POZESKY. I think it is fair to say that this is tied to the delays associated with the AAS hardware, so it is day for day link to that.

The voice switching and control system, which is shown on the next chart, is a communications system which links the centers together and replaces today's commercially leased system, which we lease from the AT&T companies around the country. This is again a program which is undergoing dual development. Two contracts of interest. This is a cost sharing development between ourselves and the two proposed primes. AT&T is one prime. Harris in Melbourne, Florida is another prime.

The dates are as shown. This will be a part of our overall modernization in the center, and it is currently, I believe—I can supply it to the record—I believe it is a cost plus development and intended to be a fixed price production when we get to that phase of the program.

Mr. MCCURDY. What do you expect the total contract to be?

Mr. POZESKY. The total contract will cost about $450 million for the total program.

Mr. MCCURDY. Why can you get cost sharing from these contractors and you can't others? Just the competition? They want in bad enough?

Mr. POZESKY. I think the answer to your question is that the original dual development required cost sharing for both of them to be successful. It started out as a cost plus contract, and then it was later modified to provide for cost sharing. They have agreed to cost share. The share ratio is not very dramatic in terms of how much we spend versus how much they spend, and the intent is that we will go fixed price on the production.

Flight service station program is a program which started out many years ago. It has suffered significant delays because of software. It is a program which I describe as typical of some of the software problems that we have encountered. If I could take a moment, this particular program was awarded to E Systems in Garland, Texas. The major software subcontractor was terminated for lack of performance, was terminated by E Systems but the FAA was consulted and agreed in that termination, and frankly, the FAA encouraged that termination.

That has since been corrected. E Systems brought that software job back in house. They have solved the software problems. We have now satisfactorily delivered the major part of the system to the field. It is working well, and we have a letter into the Appropriations Committee asking to go ahead with that program. That is a program which I think I describe as having battled our way through, having encountered software problems and having overcome those problems.

Mr. GLICKMAN. If I may, Dave, this is one that has caused some concern out in my part of the country because it is part of your

consolidation of flight service stations, and I guess my concern has been that—of course, a lot of these communities have been very concerned about the loss of the flight service station. Don, you have written to me about this not too long ago.

But I want to know that you have corrected these problems because I don't want to close the stations, consolidate, and end up with something that doesn't provide any help to the pilot.

Admiral ENGEN. I understand, Mr. Congressman, and that is well stated. Let me assure you that the Model 1 that is performing today is providing those services which we anticipated they would provide. We are going to a Model 1 enhanced program which will even improve that, which really is basically a kind of Model 2.

Our biggest problem has been in closing up the other flight service stations. I don't have the daily count today, but basically we have gone from 312 flight service stations in 1985, down to about 275 flight service stations today, going to 61 automated flight service stations plus some 52 flight service stations, as we know right now, in 1991.

I am trying to do this very gently. I am well aware of your concerns and that of the flying public out there. I am happy to report that at Conroe, Texas, at Reno, Nevada, at other places where we have been putting these automated flight service stations, we are providing a much, much better service than we have. But we are having to wean the pilots from walking in and looking at you across the counter, as I was raised to do, and we are having to send them to the computer or to the telephones so they can be provided this information. There is an education process that we are going through.

Mr. GLICKMAN. The weaning I understand. The ability of a pilot in, let's say, Goodland, Kansas who now has to use the Wichita flight service station to get adequate information, where he may have gotten, he feels, much more trustworthy information right across the counter from somebody—I want to make sure that we don't end up with 61 automated stations that don't provide adequate information. Then you have got real safety problems for all these general aviation pilots all over the country.

I assume the quality of the information has got to be as good or better than what they had before, regardless of where they are flying from, even if they are a far distance away from an automated system.

Admiral ENGEN. It does indeed, sir, and you said the magic words, "as good or better."

Let me say that as we have gone into this program, there have been times when we thought we were providing as good or better service and we weren't, and through feedback we have found out that we weren't doing what we said. The implementation of a new system is a very complex thing, and we have stepped on it once or twice, but I am happy to report to you that the Model 1 program as designed and now functioning in our major automated flight service stations is performing very well.

Mr. GLICKMAN. And your plan to close the remainder of the stations down to 61, however, I assume is contingent upon machinery that operates satisfactorily at these automated stations that

produce good or better results than are provided by the unautomated stations.

Admiral ENGEN. Yes, sir, that plus the 52 additional flight service stations which will be in place still in 1991, which won't, unfortunately, be in Kansas but will be in such places as mountainous territory or on sea coasts where sea fog comes in rapidly, where we want to be sure that we have the local weather information immediately available.

Mr. GLICKMAN. This is one we are going to be watching because, you know, it may be that you may need a few more stations than you think because of safety purposes, but we will just watch you on it. Thank you.

Mr. POZESKY. Another element in our—an important element in our NAS plan is several programs directed at the general problem of weather, improvement of weather services.

The first one we're talking about is a next-generation weather radar in which we are participating jointly with the National Weather Service and the DOD in the development of that program. It's an en route weather system. The dates are as indicated in this program. Again, this was a contract let by the National Weather Service where there was a full A-109 type of conversation and contracting process, where I think there were like five designs, down to three. I think we're now at the point where there are two designs—two people can vote—competing for a limited production.

We have delayed—or the National Weather Service has delayed the final selection pending—because both contractors have not satisfactorily completed the OT&E; however, we do expect a production award in July of '88, and to be back with the first production delivery of this system in September of '89.

This is a program in which the FAA is proposing—is jointly sharing with about 20 percent of the cost.

Mr. MCCURDY. So you're telling me the production award on this is going to slip by more than a year?

Mr. POZESKY. The production award on this is now scheduled for July '88, and, yes, I think I'd have to—it has——

Mr. MCCURDY. Maybe even more than a year.

Mr. POZESKY. It has slipped. It has moved six months. There was a decision made about three months ago which had the effect of moving it six months.

Now I'd have to research—I don't have the total slip in my mind, right off the top.

But again, we're down to two prototypes, and we hope to have the first system as shown on this chart.

We are also buying, as part of this program—we are modifying 17 of these units for terminal operation. That means putting a new software package in and buying those for application on airports for terminal application, looking at wind shear, looking at microburst, as part of this program. This is an FAA-only initiative. We will receive two of those as part of the first production release of ten. The first one of those is targeted for implementation in 1990, the first of those 17, in the terminal arena.

Mr. MCCURDY. How much can you draw upon NEXRAD for this. I mean, NEXRAD is an affected offeror, and how much concur-

rency is there, and do you have to go out and do totally separate development for this, and is there any way——

Mr. POZESKY. Let me ask Neal to talk about that.

Mr. BLAKE. Thank you, Mr. Chairman.

On both the NEXRAD and the terminal Doppler version, the terminal version of NEXRAD, the Government has done the development of the meteorological algorithms, and this has been done using other radar equipment, and these algorithms are supplied to the contractors.

The hardware that we use for both the en route and terminal systems is identical, but we do substitute a different scanning strategy and a different set of software for the terminal systems. The difference, however, is fairly minimal.

Mr. MCCURDY. If I understand, most of the research is done in my district in Norman at the Severe Storms Laboratory of the Weather Service.

Mr. BLAKE. They've done an excellent job of looking at all of the basic meteorology algorithms and perfecting them for us.

Mr. GLICKMAN. Mr. Chairman, may I ask a couple of questions on this?

As you know, I think that the weather—it's terminal Doppler, which I think we need to have, or a variation of NEXRAD may have prevented the Delta airlines crash at Dallas/Fort Worth airport, and it's very, very important.

I want to know if terminal Doppler radar systems, as you envision them, will be able to provide air traffic controllers with the information on the severity of wind shear.

Admiral ENGEN. The answer to that is yes, sir, at terminals. We don't want to turn air traffic controllers into aerological specialists; however, that's the philosophy that we're using for TDWR terminals, such as Denver and Dallas/Fort Worth.

Mr. GLICKMAN. Will you be able to determine the headwind component of a wind shear with terminal Doppler radar?

Mr. BLAKE. What we are trying to do is to automatically determine the shear along the runway. We have had a committee, which is both government and industry, working to define the hazard area, and that is an area which is a half-mile either side of any active runway and three miles off the end of the runway, both on approach and departure.

Any microburst activity occurring within the warning area will be given to the controller initially and to the pilot later by Data Link in the form of an alphanumeric warning. And yes, that will tell him the runway, the type of wind shear, the location on approach or departure, the severity of the shear, and whether the shear is increasing or decreasing.

Mr. GLICKMAN. So, then, the answer is yes. The headwind component is there.

Does the FAA plan to provide pilots with hazardous weather information provided by Doppler radar through Data Link to the cockpit?

I think your answer was yes, but I just want to get the Administrator on record.

Admiral ENGEN. Yes. Yes, it is. Through Mode S.

Mr. GLICKMAN. Is this program in the NAS plan?

Admiral ENGEN. It is. Mode S. We haven't tied up terminal Doppler weather radar and the transfer of that specific wind shear information in Mode S, but the capability is there, and we're working towards it.

We don't have—you know, we don't have the algorithms yet to do that, to be developed.

Mr. GLICKMAN. But you're—it's on the plan for development.

Admiral ENGEN. Yes, sir.

Mr. GLICKMAN. Just one last question. I understand that the new ASR-9 radars will be able to provide information on six levels of storm intensity.

Does the FAA plan to provide air traffic controllers with this information, and if so, what levels of storm severity will be provided to controllers?

Mr. BLAKE. The six levels you refer to are the standard National Weather Service defined levels. We have the capability to pick any two of those and put them on the ASR radars. And yes, they will be displayed to the terminal controllers. The controller can select them as well as his traffic display.

Mr. GLICKMAN. Okay. Well, this is only part of the problem. And the other part of the problem is, how do you relate this back to the pilot, and then what does the pilot do with the information?

But with the whole jamming of about eight airports in this country with more traffic than anybody ever dreamed of in their lives, this is an incredibly serious problem, as you know, whether it's the hub at Dallas or the hub at Denver or the hub in Chicago or St. Louis—you've got about eight of these hubs; you've got all this traffic, as you know, landing and taking off within a very short parameter of time, and you jam a severe thunder storm over there, it is chaos, a nightmare, and somehow that information—and these storms happen so quickly, and, you know—you know I've talked to you about this before.

You have got to provide better on-time weather information from the airport to the pilot.

Admiral ENGEN. Mr. Glickman, I agree with you, and that is, indeed, our goal.

You know, you've got to attack wind shear, though, from 360 degrees, and you have to put a cockpit display in. We have to improve the way we communicate from air traffic controller to pilot. We have to school the pilot.

You know, we had a—we put out a $1.8 million contract with Boeing to develop wind shear training, and that's completed now, and we have that—we're giving that to all the airlines out there to use.

We need to not only have pilot training; we need to have air traffic controller training. But we can't address wind shear just from the ground, looking up to the airplane.

The Dallas/Fort Worth accident, in my personal opinion as Administrator, could have been prevented if that pilot had said, "I'm not going to fly into that black cloud." And that, in itself, is part of the training program.

Mr. GLICKMAN. It is, but also the fact that storm developed rather quickly, and sometimes when you're below it, you can't quite determine intensity as if you were beside it or above it, and

you rely on information, and you've got a jammed-in airport with planes behind you and in front of you, there just isn't the flexibility to be—and maybe that pilot needs to be better trained in those connections, but you've got to also have the equipment available, so he's got the information, and then he's got to make the judgment.

Admiral ENGEN. Yes, sir. You're absolutely right, and that's what we're trying to develop.

Mr. GLICKMAN. Yes, okay. Thank you, Mr. Chairman.

Mr. POZESKY. Mr. Chairman, the next program which is the terminal Doppler weather radar program. This is a program which, by our own admission, we are on an optimistic schedule. We are targeting to put together our development—I'm sorry—a production RFP to go out and award a contract by the end of Fiscal Year '88. It is a very ambitious program. In order to achieve that objective, we have given technical direction of this program to Martin Marietta. They have put together a dedicated team of about 25 engineers to do—go through the paperwork, the engineering, the design work necessary to get on and meet these dates, and we are very hopeful of making the contract award in Fiscal Year '88. But it is an ambitious schedule, without question.

Mr. MCCURDY. Well, I hope in a contract like that—you know, I'm not trying to micromanage; I'm just—a little common sense—that you would use the experience with other similar systems as a gauge, and the DOD occasionally seems to award contracts based on spreading the work, and a lot of times you spread the risk or you increase the risk overall, and I would hope if we have a risk-reduction program in the NEXRAD, that that could possibly apply or at least transfer to the terminal Doppler.

Mr. POZESKY. We believe it does, and we believe we're taking advantage of it, and I'll be happy to explain that in more detail.

But let me say one more point—let me make one more point, and I'll get off this kick.

The risk is what, in many cases, is called the risk of a new build, simply the act where there are no engineering problems, but there are complex pieces and parts that fit together, to engineer, to hone, put them all together to make them work and to meet a schedule—just that event, even though there are no technical, technologic problems to overcome—comprises a substantial schedule risk, and that's the kind of risk that we think we're probably facing in these kinds of programs.

Mr. MCCURDY. Well, we have found the largest component to cost overruns has been overly optimistic design or overly optimistic contractors thinking that they can manufacture to their design very quickly and engineers. They always want to solve the problem, but they sometimes underestimate the extent of the risk and the problem, and if we have—have had successes in other areas—on the other hand, if you've had bad performance from a contractor, then you sure as the devil don't want to turn around and award another contract to the same company.

Mr. POZESKY. I understand.

Okay, let me go on to another element of our program, the center weather processor. This is a program which is a major data processor to take all the weather information, crunch it in the computer, and distribute through the network.

We've engaged the Jet Propulsion Laboratory through NASA to work this program with us. This is an R&D funded program. The dates are as shown. We've had significant delays in this program that were caused by requirements instability. We haven't spent a lot of money, but we have had a problem in solidifying and calming down the requirements. The requirements are now baselined.

We've had JPL top management involved in committing to this program, and we're on the track—we believe we're on the track with this program.

Mr. GLICKMAN. Could I just ask a question? When you get the delivery, the field delivery, what are you going to have? How is the user going to use this kind of——

Mr. POZESKY. This machine is really an internal data processor that will deliver the bits of data around the system. It won't be directly accessible by the user, but the Mode S conversation you just had before, this would be the device that extracts the algorithm from the radar, sends it to the Mode S machine, who will then transmit it to the——

Mr. GLICKMAN. So hypothetically, a pilot leaving Washington National will be able to get information either—perhaps through his own company's meteorologist, that will tell him, "Thunderstorms building 60 miles west of Chicago within the last 15 minutes. By the time you approach, may be over O'Hare. You may have to circle. Hold."

I mean, I'm just trying to figure out what it's going to do. Is that the kind of thing it might do?

I mean, they won't tell him to hold. That's the company that will tell——

Mr. POZESKY. Yes, sir. And that information will be due, in some part, to the processing going on in this thing. This device will look at the radar, extract the hazardous area, form the message, transmit it to the Mode S Data Link, send it to the cockpit through the Mode S system. So the pilot won't actually see this. It will feed the Mode S system. It's kind of an internal data processing within the infrastructure of the NAS plan. That's what this CWP does.

The next element again is an AWOS system, which is a weather sensor, automatic weather reporting sensors, that go at airports or go at flight service stations, that would transmit to the aircraft weather information. We've tested this system. We've just struck an agreement with the National Weather Service on a government-wide procurement of over 1000 of these devices. We're very much—we are very much supporting that system, and that RFP will be out through the National Weather Service, a competitive RFP, as indicated on this chart in 1988. The name of the program we'll call ASOS, because that's the National Weather Service device, and hopefully we will begin to implement this system as a part of the NAS plan on the target date shown before here.

Another element of our weather program is a low-level wind shear system. We have 110 of these systems in the pipeline; 90 of them, I think, are probably—90, I think, is the right number—are currently commissioned. We're in the process of upgrading this from a six ground-based sensor system to an eleven ground-based sensor system on the date shown here, and this is an important part of our airport-dependent wind shear program.

The next program I'd like to talk about is something which I know this subcommittee is very, very familiar with, because it was instrumental in supporting the development of that, and that is the development of our traffic alert and collision avoidance system or TCAS.

As I'm sure you know, the first airborne collision avoidance system is now flying in passenger traffic. Piedmont is flying the first system. It is something which we—the Administrator has announced his intent to issue a rule for the carriage of the TCAS-II system on commercial aircraft. It is something which we view as a significant success, due in part—due in large part to the support of this subcommittee and to the 20 years of development effort that has gone into the development of the collision avoidance system.

Mr. MCCURDY. Yesterday in the hearing, we had the—many of the users were arguing that we ought to be moving with TCAS-III, because TCAS-II was already obsolete.

How do you respond to—a

Admiral ENGEN. Let me address that, Mr. Chairman.

A year ago last November, I asked that the standards be set by 1 April 1986. They were set on the 17th of April 1986.

We've come a long way in defining TCAS-II. As Mr. Pozesky said, it is flying with Piedmont today. There are 14 additional sets that will be installed by United Airlines, Northwest, and Piedmont this year in a LIP improvement program, and it's working.

My answer to those people who say, "Don't install TCAS-II; wait for TCAS-III" is, we've waited long enough for TCAS-II, and I would much prefer to pull up or push over and miss today than sit around for two years, three years, or maybe even four years more for TCAS-III.

You have my dedication and that of the entire FAA to continue to develop TCAS-III. We must bring it along; we must install it. Hopefully—hopefully—we can do that in some way that we can trade on the TCAS-II installation in a way that it doesn't—you don't have to go out and buy an entirely new system; we can upgrade.

Mr. GLICKMAN. Could I just ask one question on that? I am told that TCAS-II has an unnecessary alert ratio of 50 percent—five-zero percent. Is that true, and is there any concern on the part of the FAA about the reliability of the system?

Admiral ENGEN. We must certify the equipment we use both on the ground and in the air to about 99.99 percent.

I would like to provide for the record, because I'd like to be very accurate about that 50 percent figure. It's something that's foreign to me, Mr. Glickman, and I'm not familiar with that, and I don't know if either—Neal are you familiar with that?

But I will provide it for the record.

[Information to be furnished follows:]

TCAS II provides resolution advisories to the pilot when certain threshold values are reached. These thresholds are time to closest approach or minimum range values. If an additional function is added to accurately compute horizontal miss distance, it is possible to reduce somewhat the number of unneeded alerts generated. This computation requires the use of antenna systems that allow accurate determination of bearing to the intruding aircraft. Past tests have shown that approximately one alert is generated every 40 hours of flight that could be considered unnecessary. Simulations conducted using the horizontal miss distance filter indicated that

the time between unneeded alerts could be increased to approximately 55 hours. If it were possible to build a perfect antenna (it is not), the time could be increased theoretically to 80 hours. The remaining unneeded alerts are generated as a result of aircraft maneuvering somewhat about the desired flight track. In all cases, TCAS II generates advisories that are conservative to avoid failing to advise the pilot of a potential hazardous situation. This results in the low level of unneeded alerts noted above.

Mr. BLAKE. I think the reference is to alerts that might have been avoided if one had some additional circuitry. It is possible, and as a part of the TCAS program, we had developed and evaluated a more accurate antenna system, which is in use on some of the TCAS–II units, and logic to go with it, which is referred to as a missed-distance filter that will reduce the perhaps unneeded alerts by some percentage. Our latest look at that says it's far less than 50 percent, though.

But, yes, that design exists and is available to the industry.

Mr. GLICKMAN. Mr. Chairman, I think it would be useful to have this information in the subcommittee, if you could provide that.

Mr. BLAKE. Sure.

Mr. POZESKY. The next program I'd just like to talk about briefly is something again that I know this subcommittee has been deeply involved with, and that is the Mode S and its associated Data Link program.

It is a contract that went through the full R&D cycle. The R&D was done by Texas Instruments. A production contract was awarded to Westinghouse in Baltimore. It is not only an improved beacon system for air traffic control surveillance, but contains a high capacity air-to-ground Data Link for computer-to-computer communications.

That program is about 12 months late, again software problems. The prime software contractor—it's a—the software is being done by Unisys. They have experienced software difficulties, but again no technological problems.

We can see hardware. It's coming together, and we expect to have the first delivery in '89.

Mr. Chairman, there are about seven or eight other programs in my package, and I'm mindful of the hour.

Would you like to prefer to go on to Mr. Blake's testimony and then perhaps come back, or what is your preference?

Mr. MCCURDY. Why don't you just quickly go through them, and why don't you just highlight where they are on their schedule and their cost and the contract?

Quite frankly, I want to have a public record more visible for where these problem areas are, and if we have to revisit them next year when we do this or two years from now, we'll be able to say, "Why weren't you there" or applaud you for your progress.

Admiral ENGEN. Perhaps we could provide that for the record for you, if you wanted to move on, and we'd be very pleased to do that.

Could I say, Mr. Chairman——

Mr. MCCURDY. Certainly.

Admiral ENGEN. You know, there are a lot of people commenting on the National Airspace System Plan out there, and we live with it on a daily basis, and there are some people—at least, I've read in articles—that acknowledge that we're five years into the NAS plan, but we're seven years behind.

That's difficult to do. And there is a truth to the NAS plan that is, I feel, very evident to us. We are about to receive large amounts of equipment. We are going to be receiving between 80 and 100 pieces of equipment each month, and over the next several years, as Mr. Pozesky said earlier, we are going to be receiving this equipment, and our problem is going to be one of installation, and we're addressing that today.

Mr. McCURDY. Admiral, the only point—and we will have that for the record, Mr. Pozesky, and we will move forward and on with Mr. Blake.

[Information to be furnished follows:]

U.S. Department
of Transportation
Federal Aviation
Administration

The National Airspace System

NAS at MID-STREAM

March 25, 1987

NAS Plan -- Progress

- 12 of the 88 NAS Projects Have Been Completed
- Another 2 Projects Will Finish in 1987
- Over 90% Have Been Started by the End of FY-1987
- Over 75% of Contracts Are Awarded
- Deliveries Have Begun on Over 50%

Modernize ATC Host Computer

Objective:

Provide Modern Computers and Associated Software for the En Route Centers Needed to Handle the Growing Demands for Air Traffic Services in the Late 1980's and Beyond. In Addition, the Host Computers Will Provide Reliability Improvements and Accommodate Near-Term Functional Enhancements.

Status:

- **Awarded Contract July 26, 1985 for $197.1M**
- **Accepted First Site Delivery November 1986 — Seattle**
- **First Operational Readiness Demonstration Planned for May 1987**
- **Last Operational Readiness Demonstration Planned for 1989**

Advanced Automation System (AAS)

Objective:

Provide a Total Automation System That Includes New Controllers Sector Suites, New Computer Software, and New Processors to Augment the Host Computers. The Advanced Automation System Will Provide the Capacity to Handle the Projected Traffic Load Through the 1990's and Beyond; the Capability to Perform New Functions to Be Introduced Into the ATC Through the 1990's; Increased Productivity Through the Introduction of New Sector Suites at the Earliest Practical Time; and a High Degree of Reliability and Availability.

Status:

- AAS Replan Calls for:
  - Earlier Down Select of Acquisition Contractor (After PDR)
  - Limitation of Cost Growth and Schedule Slippage
  - Additional Testing of Critical Hardware Components Before Production Go Ahead
  - Earlier Date to Begin TRACON Consolidations
  - Evaluation of Advanced Automation Functions (AERA 2) in Simulation Lab Before Committing to Production Programming
- Schedule:
  - Preliminary Design Review (PDR) Completed — December 1986
  - Sector Console Prototype Demonstration Scheduled — February Through April 1987
  - Release RFP for Acquisition Phase — August 1987
  - Award Production Contract — June 1988
  - Initial Sector Suite Implementation Starts — 1993
- Issues:
  - Release of $75.3M of Funding Held in Reserve by Congress Is Critical to Keeping the Design Competition Phase Contractors Going

Automated En Route ATC (AERA)

Objectives:

- Develop and Implement Automation Features to:
  - Facilitate User Preferred Routes
  - Increase Controller Productivity
  - Enhance Safety (Reduce Blunders)
- AERA 1: Alert Controllers to Predicted Conflicts
- AERA 2: Propose Conflict Resolutions to Controllers
- AERA 3: Automate Routine Controller Tasks and Conflict Resolutions

Status:

• AERA 1: (Included in AAS Production Contract)	
– Functional Spec to AAS DCP Contractors	1985 Completed
– First Site Operational	1996
• AERA 2: (Option in AAS Production Contract)	
– Draft Functional Spec Completed	1986 Completed
– Approval of CDR	1993
– First Site Operational	1999
• AERA 3:	
– Draft Functional Spec Completed	1989
– Field Testing at First Site	1999

Voice Switching and Control System (VSCS)

Objective:

Provide a Voice Communication System Which Performs the Intercom, Interphone, and Air-Ground Voice Connectivity and Control Functions Needed for Air Traffic Control Operations.

Status:

- Prototype Development Phase
  - System Specification Review Scheduled — January 1987
  - Critical Design Review — September 1987
  - T&E at FAA Technical Center — March 1989
- Production Phase
  - Contract Award — 1989
  - First Operational Readiness Demonstration — 1990
  - Last Operational Readiness Demonstration — 1992

Flight Service Automation System (FSAS)

Objectives:

- Promote Flight Safety Through More Accurate and Timely Pilot Briefings
- Meet Forecasted Increased Demand for Services (79 Percent Growth in Hours Flown by 1993)
- Reduce Costs to Provide Services ($1.3 Billion Over 17 Years)

Status:

Contract Award	1981 (Complete)
	M1
First Implementation	1986
Last Implementation	1988

Next Generation Weather Radar (NEXRAD)

Objective:

The FAA's Purpose for Involvement in the NEXRAD Program Is to Provide Doppler Weather Radar Data to Center Weather Service Unit (CWSU) Meteorologists, ARTCC and Terminal Controllers, FSS Specialists and Pilots. In Addition to the DOT, the DOD and DOC Are Also Participating in the Development of NEXRAD.

Status:

• Multiple System Definition Contract Award	1982 Completed
• Validation Phase Contracts	1983 Completed
• Production Contract Award	1987
• First Production Delivery	1989
• Last Production Delivery	1993
• Last ORD	1994

Terminal Doppler Weather Radar (TDWR)

Objective:

The Purpose of This Effort Is to Establish TDWRs at High Activity Airports. This Radar Will Provide Accurate and Reliable Hazardous Weather Detection in the Terminal Area With an Emphasis on Microburst/Windshear Detection.

Status:

- **Contract Award** **1988**
- **First Delivery** **1992**

Center Weather Processor (CWP)

Objective:

The Objective of the CWP Project Is to Improve the Management, Synthesis, and Dissemination of Weather Information Throughout the National Airspace System (Pilots, Controllers, Meteorologists, Etc.). Improvements Are Needed Due to the High Percentage of Weather-Related Accidents and Air Traffic Delays.

Status:

• System Support Contract (JPL)	1983 Completed
• Preliminary Design Review — Prototype	1987
• Critical Design Review	1988
• Production Prototype Delivered (T&E)	1989
• Hardware Contract Award (Production)	1991
• First Hardware Delivery	1993
• Last Field Delivery	1994

Automated Weather Observation System (AWOS)

Objective:

To Provide Automated Surface Observations at FSSs and Airports With Towers and Airports With Precision Approach Landing Systems (ILS-MLS). These Observations Shall Contribute to a National Data Base of Surface Observations, Shall Be Disseminated Directly to Pilots and Shall Be Transmitted to the NWS for Use in Preparing Forecasts.

Status:

- **ASOS-NWS Contract Award** **1988**
- **Deliver First Production Unit** **1990**
- **Last Deliveries** **1994**

Low Level Wind Shear Alert System (LLWAS)

Objectives:

Severe Windshear Conditions Occurring at Low Altitude in the Terminal Area Are Hazardous to Aircraft Encountering Them During Takeoff or Final Approach. The LLWAS Monitors Winds in the Terminal Area and Alerts the Pilot, Through the Air Traffic Controller, When Hazardous Windshear Conditions Are Detected.

Status:

• Contract Award (E-LLWAS and 6-Sensor System)	1983 Completed
• First Site Commissioning (6-Sensor System)	1985 Completed
• Last Site Commissioning (6-Sensor System)	1987
• Contract Mod (6-Sensor Improvement)	1987
• Contract Mod (11-Sensor Expansion)	1987
• First ORD (6-Sensor Improvement)	1987
• First ORD (11-Sensor Expansion)	1987
• Last ORD (6-Sensor Improvement)	1988
• Last ORD (11-Sensor Expansion)	1990

Traffic Alert and Collision Avoidance System (TCAS)

Objectives:

To Provide an Aircraft Separation Assurance Back-up to Normal Air Traffic Control Operations.

Status:

• Design Guidelines for TCAS I (Final)	1982 Completed
• Contract Award for TCAS-II Operational Deployment	1984 Completed
• Start TCAS-II Operational Deployment (Piedmont)	1987
• TCAS-I Minimum Operational Performance Standards (Final)	1987
• National Standard for TCAS-III	1987
• Complete TCAS-II Operational Deployment	1988
• TCAS-III Minimum Operational Performance Standards (Final)	1988

Mode S/Data Link

Objectives:

The Objective of This Program Is to Provide the Improved Surveillance and Communications Capabilities Required to Meet the Need of Automated Air Traffic Control (ATC) in the 1980's. Specific Goals Are:

- **Overcome Surveillance Limitations of the Present Air Traffic Control Radar Beacon System (ATCRBS)**
- **Provide an Integral Two-Way Data Link**
- **Evolutionary Transition From the Present System**
- **Reasonable Cost to the Airborne User**
- **High Availability and Reliability**

Status:

• **Contract Award**	**1984 Completed**
• **First Delivery (FAATC for Tests)**	**1988**
• **First Site Delivery**	**1989**
• **Last Site Delivery**	**1994**

RML System Replacement

Objectives:

Replace Existing RML Equipment, Used Primarily for Radar Remoting, With Equipment That Can Be Used for General Purpose Interfacility Communications. New Facilities Will Be Added to Tie Existing Facilities Together Forming a Complete National Communications Network. This Network as Part of the Overall Transmission System Will Minimize the Cost of Interfacility Communications, Decrease Outages, and Provide the Flexibility to Accommodate NAS Plan Requirements.

Status:

- Contract Award — 1985 Completed
- First Delivery — 1986 Completed
- Last ORD — 1992

Terminal Radar Program (ASR-9)

Objectives:

- Replace 96 Vacuum-Tube Radar Systems With Solid State
- Leapfrog 56 ASR 7/8 to ASR 4/5/6

Status:

• Contract Award	1983 Completed
• First System Delivery (Operational Site)	1987
• First ORD	1988
• First Leapfrog Installation	1989
• Last Leapfrog Installation	1990
• Final Delivery	1990
• Last ORD	1991

Long Range Radar Program

Objectives:

The NAS Plan Requires the Networking of En Route Radar, Terminal Radar Into a Cost-Effective System Providing Primary Radar Coverage of Both En Route and Terminal Airspace. Vacuum Tube Radars Will Be Refurbished. DOT and DOD Jointly Will Participate in the Development and Acquisition of Replacement Three-Dimensional (3-D) Radar.

Status:

A. Refurbishing Vacuum-Tube Radars	
Contract Award	1985
First Delivery	1987
Last Delivery	1988
B. Three-Dimensional (3-D) Radars	
Contract Award (3-D Radars)	1988
First Delivery (3-D Radars)	1991
Last ORD (3-D Radars)	1994

Loran-C

Objectives:

Define Requirement for Integration of the Loran-C Navigation System Into the NAS; Conduct Necessary Procurement and Implementation Projects to Meet FAA Responsibilities in the Use of Loran-C in the NAS as an Interim Supplemental Aid, and Support Transition to the Future Navigation System, or Mix of Systems, Selected in the Joint DOD/DOT Recommendation.

Status:

• Contract Award (Systems)	1987
• Contract Award (USCG — Transmitters)	1987
• System Delivered to 1st Operational Site	1989
• First ORD (Transmitters)	1991

Microwave Landing System (MLS)

Objectives:

Develop and Implement New Terminal Guidance System With Improved Accuracy and Operational Flexibility.

Status:

• Contract Award (1st Buy)	1984 Completed
• First Production Delivery (1st Buy)	1988
• Contract Award (2nd Buy)	1988
• System Delivered to 1st Operational Site (2nd Buy)	1991

NAS Plan — Next Steps

- Focus on Implementation:
  - Over 50% of the NAS Plan Projects Are Sending Equipment to the Field
  - Focus Is Shifting to Include a Strong Implementation Element, as Well as System Design/Equipment Design and Development
  - Processes Such as Deployment Readiness Review and NAS Change Proposal System Are in Place to Prevent Premature Issuance of NAS Components
  - Martin Marietta, as the Systems Engineering and Integration Contractor, and Their Team Member Ralph M. Parsons, Will Be Heavily Involved in Implementation
  - Nationally Selected Technical Support Services Contractor Will Provide Manpower to Assist FAA Regions in Installation, Site Preparation and System Check-out of NAS Plan Components

1987 SEI Initiatives

- Technical Direction Role
  - Several Projects in FY 87
- Implementation
  - Planning — National
    Regional
    Facility
    Site-Specific
  - Standard Design
    - Major Projects
    - Major Facilities (Site Adapted Design for Major Facilities)
  - Integration & Installation Plans, Test Scenarios

NAS Plan 1987 MODIFICATIONS

- Other Capital Needs Chapter Added

  --Identifies Facilities and Equipment Projects Not in the NAS Plan

  --Consists of Facilities Maintenance, Newly Recognized Cost Avoidance Opportunities and Systems Enhancements Made Possible by Emerging Technological Advancement

Progress on the National Airspace System (NAS) Plan

Major FAA Facility Capability Accomplishments

Air Route Traffic Control Center/Area Control Facility (ARTCC/ACF)

- ARTCC Building Expansion Completed at Fort Worth, Houston, Denver, Kansas City, Albuquerque, Los Angeles, Cleveland, Washington, and Seattle
  - Eight Other ARTCCs More Than 90% Complete; All To Be Complete Mid-1987
  - Expansions Added 9600 Square Feet To Accommodate Equipment, Technical, and Operations Space Requirements
- Host Computer Modernization Began with Delivery of First Host Computer to Seattle ARTCC in November 1986
  - Host Quadruples ARTCC Computer Capacity and Increases Processing Speed Almost 10 Times
  - Host Sets Automation Base for Achieving Conflict Resolution Advisory and Other Air Traffic Control Service Goals
- Advanced Automation System (AAS) Design Contractors Completed System Design Reviews and Demonstrated Data Entry and Display Devices
- Automated En Route Air Traffic Control (AERA) Will Provide Operational Software for the AAS
  - AERA Phase 1 Incorporated into AAS Design Specification
  - AERA Phase 2 Concept Definition Completed
  - AERA Phase 3 Operational Requirements Analysis Began
- Flight Data Input/Output (FDIO) Delivery of Replacement ARTCC Flight Strip Printers Began; New Equipment Removes Obsolete, Maintenance-Intensive Equipment
  - Deliveries Made to Washington, Seattle, Houston, Denver, Boston, Chicago, Oakland, and Los Angeles ARTCCs
- Traffic Management Units (TMU) in the ARTCCs Automated and Are Now Able To Exchange Data Directly with the Central Flow Control Facility To Establish and Control Efficient Air Traffic Loads at Major Airports and Along the En Route Airways
- Replaced All Tube-Type Ground-to-Air Radios Used by ARTCCs To Control En Route Air Traffic with Highly Reliable Solid-State Radios

Major FAA Facility Capability Accomplishments

Air Traffic Control Towers/Terminal Radar Control (ATCT/TRACON)

- Automated Transfer of Flight Progress Information between En Route ARTCCs and Terminal ATCT/TRACONs
  - Controller Productivity Increased As Automation Helped Reduce the Need for Labor-Intensive Controller-to-Controller Telephone Coordination of Aircraft Movements
- Installed Low-Level Wind Shear Alert System (LLWAS) at 85 Airports
  - Provides Tower Controller with Indications of Possible Wind Shear Conditions Occurring Around the Airport
- Added Additional Memory Capacity to the Terminal Air Traffic Control Computer Systems at 62 of the Nation's Busiest Airports
- Continued Project of Integrating Non-Radar Approach Control Facilities into Facilities Equipped with Radar
  - Improves Level of Positive Control for Users by Maximizing Use of Existing Radars
  - 15 Facilities Have Been Integrated to Date
- Proceeding with Deliveries of Integrated Communications Switching Systems (ICCS) To Replace Obsolete Telephone and Intercom Systems in Control Towers and TRACONs
  - Delivered 107 of the 163 Systems on Contract
- Awarded Contract for Replacement Bright Radar Indicator Tower Equipment (BRITE)
  - BRITE Provides a Television Display of Radar Information to the Tower Controller and Helps Improve Separation and Sequencing of Aircraft in the Airport Control Zone
  - BRITE Will Be Provided to an Additional 40 Airports As Well As Replacing All Existing Equipment

Major FAA Facility Capability Accomplishments

Airports

- Annual Contracts and Equipment Deliveries of New Airfield and Approach Lighting Systems Continuing
  - New Systems of Standard Design Achieve Economics of Operation, Maintenance, and User Familiarity
- Replacing Tube-Type Ground-to-Air Radios in Terminal Area
- Awarded Microwave Landing System (MLS) Contract To Replace the Instrument Landing System (ILS); Availability of Frequencies for ILS Is Finite and Spectrum Is Saturated
- Upgrade of ILS Components with Solid-State Devices Underway
- Navigational Aid Upgrades Underway – VORTAC, NDB, DF
- Airport Surface Detection Equipment (ASDE) Contract Awarded
  - Expands ASDE to 13 Airports
  - Replaces Equipment at 17 Airports

Flight Service Stations (FSS)

- Automated Flight Service Station (AFSS) Model 1 Equipment Deliveries Completed
  - Flight Service Data Processing Systems (FSDPS) Installed in 13 ARTCCs To Provide Main Data Processing for AFSSs
  - AFSS Equipment Delivered to 37 AFSSs; 23 Facilities Now Operational - When All 37 AFSSs Are Commissioned, 76 Smaller Flight Service Stations Will Be Closed
  - Delivery of Integrated Communications Switching Systems (ICSS) for Flight Service Stations Continuing; 36 of 45 Systems Under Contract Delivered
  - Outmoded Teletype Equipment Replaced; Equipment Used To Distribute Flight Plan, Weather, and NOTAMs
  - Contract Awarded To Replace and Expand Hazardous Inflight Weather Advisory Service (HIWAS); Used by FSS, Tower, and ARTCCs To Provide Continuous Broadcast of Significant Weather Advisories

Unmanned Facilities

- FAA Participating with Dept of Commerce To Develop Next Generation Weather Radar To Improve Detection of Hazardous Weather
- Radar Microwave Link Completed; Increases Efficiency of Existing FAA-Owned Communications Links between Facilities
- Radio Communications Links Being Established To Reduce Dependence on Leased Communications
- LORAN-C Monitors Being Purchased To Provide Signal Integrity Check; Permits Establishment of Non-Precision Approach Capability Where No Other Navigational Aid Signal Coverage Exists

Mr. MCCURDY. But I'm a little disturbed. I don't know if it's just the unique experience of working with the Pentagon and the intelligence community, but Cap Weinberger always appears before us, and he puts up a chart, and he shows the estimated savings because of a multiyear contract, billions of dollars.

But we really don't know, because it's an estimate. And they're always saying, "We need to buy two aircraft carriers this year, because if we buy two, we will save an extra billion dollars because of the jointness." And the list goes on and on and on, and whatever the system is—and they have this incredible optimism out there—if you'll just give them enough money—it's like my wife with a credit card, you know. "I've got to run down to this sale, so I can save you money," except the credit card bill keeps coming in.

Mr. GLICKMAN. Does your wife do that, too? They must have gone to the same sale. [Laughter.]

Mr. MCCURDY. Actually, she's better than I am at it.

But the issue is, why is it that there's almost a double-standard? Does OMB treat you all just totally different? Do you have a tougher Secretary to work for than does DOD?

Why is it that they always continue to come in and win their way, but when you come forward and we have authorized program, and yet you get passbacks, and OMB scrubs you all, but we don't see it in the other building?

And I'm the only person who sits on all three committees. And I'll tell you, Casey doesn't do it, and when he wanted something, then it was amazing how they would push through, and they got support for it, and OMB was either buffaloed or bluffed or what.

Why the different treatment?

Admiral ENGEN. You know, as you look at the program, there are so many people who think they have their hand on the throttle in the National Airspace System Plan, that I get a lot of help all over vis-a-vis the delay in the advanced automation program and others. So there's enough blame to go around all over.

I've got to look you in the eye, Mr. Chairman, and say to you that we go in and we ask for the dollars that we feel are necessary to make the National Airspace System Plan occur.

Between Congress and ourselves—between Congress and the Administration, there have been some very basic funding shortfalls over the last four or five years. I could just say to you that I understand fully what we need to have to implement the plan. We go forward with our budget. I've received strong support from the Secretary in our 1988 budget, which, as you know, is 67 percent more in F&E than 1987.

But there have been some differences of opinion over time, and Congress itself has not appropriated the monies asked for, and the Administration has not asked for——

Mr. MCCURDY. Well, when I looked at the chart, it showed that the authorization was at one level and appropriations at another and request at even a lower, or maybe the request is in between, but it's clear that there's not——

Admiral ENGEN. Civil programs——

Mr. MCCURDY. It's not in sync here for some reason.

Admiral ENGEN. Yes. Well, I'd like to think that as we come down to this production phase, as Mr. Harris said, where we must

spend the money available, we know what we need to spend for the contracts that we have let out there. We know that we're about to receive this equipment, and we're in a different phase of the NAS plan today than we were over the last three or four years.

And if we do not achieve those funding levels, it will be an equipment-by-equipment or dollar-for-dollar slip. We're going to have to achieve the funding levels to procure that equipment during the remainder of the NAS plan timeframe.

Mr. GLICKMAN. I'm not going to ask you this to embarrass you, because I think you've been an outstanding Administrator, and you have been—since I've been in Congress, you've been the Administrator that has had the least flak from this place of any of the Administrators—but there's talk out there on the street that one of the reasons why you are leaving now in the midst of the NAS program is because of unacceptable treatment by the Department of Transportation in many areas, including not only regulatory interference, but also the second judgment, second-guessing on expenditures in the airport trust fund, including the NAS plan.

I mean, I just thought I would give you the opportunity to answer that easy question. [Laughter.]

Admiral ENGEN. Mr. Glickman, I respectfully decline to answer. [Laughter.]

You know, that's a very personal thing, and I would like to say that I have received strong support from the Secretary for the 1988 budget, and I would like to leave in my mind, please, the reasons for departing.

Mr. MCCURDY. Well, we respect your position, Admiral. Mr. Blake, go ahead and proceed and we'll come back to it.

Mr. BLAKE. Thank you, Mr. Chairman. I'm going to speak briefly about some of the regulatory support programs that we have and then wrap up on the R&D program.

Starting in fiscal year 1986, the Aircraft Safety Program had produced a number of rulemaking actions, and we changed the emphasis to be more on in-flight fires, fire and impact characteristics of composite materials and improved methods of explosives detections, and some of the highlights of the FY88 program are shown in the next several viewgraphs. Could I have the next one please? [Slide.]

Mr. BLAKE. In the cabin fire safety area we're continuing our program in the development of systems for detection, suppression and extinguishment of in-flight fires. This program also includes studies to determine the adequacy of current systems and to define improvements for emergency in-flight smoke ventilation procedures for these systems.

Mr. MCCURDY. Can I ask a question at this point?

Mr. BLAKE. Yes.

Mr. MCCURDY. Maybe the Admiral can answer it. I understand a lot of this fire safety work was done in Oklahoma City there, but I want to ask you a regulatory question, and that is, does the FAA have the authority today to ban smoking on airlines without legislative action?

Admiral ENGEN. Smoking happily is not an FAA—under the FAA purview, and that's—I've said that tongue in cheek. That

really comes under what has been with the CAB in the past and resides with the Department.

Mr. MCCURDY. Within—could it be by regulation within the Department, you're telling me? Just another agency within it?

Admiral ENGEN. I would imagine that it could. It was under the CAB, and I believe that function transferred to the Department.

Mr. GLICKMAN. But if you determine that smoking were in fact a safety hazard, then I assume you'd have some authority in that area.

Admiral ENGEN. Yes, sir. That comes in the cabin air quality, and in fact, the Department did a study just recently which was not—was not that definitive. It didn't come up that it was of that magnitude.

Mr. MCCURDY. Well, if after the fire that the airliner, I think with in Canada that had the fire in the restroom——

Admiral ENGEN. Yes, sir.

Mr. MCCURDY. And they banned smoke, or they went and, you know,—was that an airline change, or was that FAA that said—that kind of cracked down on that?

Admiral ENGEN. I was the—I happen to be the member of the National Transportation Safety Board that investigated the Air Canada accident at Cincinnati, and it was—it was found that the reason that the fire progressed as it had, it was that there—that the fire warning devices, their smoke devices in the lavatory didn't perform as they should. To my knowledge, Air Canada didn't ban smoking. It is against the law to smoke in the lavatory, and that is—that's very clearly stated and each airline states thou shall not——

Mr. MCCURDY. It's against FAA regulations, or against the law? I mean I'm trying to get——

Admiral ENGEN. I've got—as administrator, I've got to say to you I believe it's the FAA regulation that you will not smoke in the lavatory, but that—you can smoke in the cabin.

Mr. MCCURDY. Thank you.

Mr. BLAKE. The Fire Safety Program is also assessing the feasibility of a computer assisted emergency management system for in-flight fires. We have studies that are continuing on developing methods of increasing the post-crash fire burn through resistance of an aircraft fuselage, and this becomes particularly important in view of the projected use of lightweight aluminum alloys and composite material.

In the area of crashworthiness, we are developing impact survivable scenarios for commuter aircraft as a basis for evaluating the impact response of current aircraft structures. We have focused our activities on advanced composite materials, and in particular, their impact characteristics, failure characteristics and damage growth behavior. We will develop procedures, analytical techniques and the data necessary to be used as a guide in constructing and conducting failure analysis investigations of fibre reinforced composite structures, particularly some of the newer methods under development at NASA.

We will continue to refine our analytical techniques which were originally developed for the all metal aircraft structures to address composite structures which predict airframe and landing gear per-

formance, as well as seat and restraint system response. And all of this in a crash impact situation.

In addition, technical handbooks and reference manuals will be developed to assist FAA personnel in assessing the performance of advanced composite materials.

Mr. GLICKMAN. If I may just ask a question back on fire safety for a minute? After you conducted that test, the crash test, maybe it affects both these areas of that 720 where you had that anti-misting fuel and the results were perhaps mixed, not as good as you would have thought. Have you abandoned any more work in the whole issue of fuel that is nonflammable.

Admiral ENGEN. I have an expert on my far left, and I'm going to let Mr. Blake respond to that.

Mr. GLICKMAN. He's the anti-misting expert?

Mr. BLAKE. We'll talk about fuels, I think, down about 1 or 2 viewgraphs.

Mr. GLICKMAN. Okay. All right.

Mr. BLAKE. In the flight safety area, we're continuing our long term efforts on all aspects of the environmental characterization, and the FAA icing program forms a part of the activity covered by the Office of the Federal Coordinator for Meteorology's National Icing Technology Plan, which was published in 1986. In the Icing Program in FY88, we will complete the worldwide atmospheric environment characterization database in the areas of super cool clouds, snow, ice crystals, freezing precipitation and mixed conditions.

Studies will also continue to further the definition and use of simulation and analytical techniques in the certification process, and that's to reduce the time and cost to industry of bringing new products and new aircraft online.

The multiyear effort to develop an updated handbook on aircraft icing technology will also be completed, but in 1989. A joint effort with NASA will result in the development of icing instrumentation calibration standards which are sorely needed today.

In the lightning area, we will be conducting or continuing our lightning strike data acquisition and analysis efforts this year and we're particularly looking for cloud to ground strikes. A report on lightning characterization data will be published in 1990 at the completion of this work, and will serve as a basis for updating our current advisory circulars.

Mr. MCCURDY. Do you have any details as far as lightning strikes? Is that a reportable incident? I mean, is it required to you?

Mr. BLAKE. We do get reports on lightning strikes affecting air carrier aircraft and we have been keeping track of those and also of any damage that was inflicted on either civil and in some cases, military aircraft as a result of that.

Mr. MCCURDY. Well, I'm aware of some of the military's. As a matter of fact we had a radar knocked off not too long ago, in a pretty healthy strike.

Admiral ENGEN. It gets your full attention, I'll agree.

Mr. MCCURDY. It definitely would in a C-21, but it was—it's not an AWACS, that was a different thing.

Mr. BLAKE. It's a continuing problem and we had 3 airlines and 1 military aircraft struck on the west coast in 1 day several weeks ago.

Mr. GLICKMAN. If I may ask something on the de-icing? After the Air Florida crash, and as part of that, there was a discussion of how there was great confusion. Not only who was doing the de-icing, but what was the proportion or the intensity of the glycol mix, and then we—there was discussion that time, there was really no rule to tell the airline what that mixture ought to be like, and have you clarified any of that since that incident?

Admiral ENGEN. Mr. Glickman, the rule stands that the operator will de-ice the airplane. We don't tell him or her how to de-ice that airplane. It says that you will take off with your wings free of ice. Yes there are differing mixtures that different airlines use. Each one must be effective and must meet the rule, but rather than specifying that it's going to be a certain-certain percentage, we say you must make sure that the wings and fuselage are clear of ice.

Mr. GLICKMAN. Yes. Okay.

Mr. MCCURDY. Why, on the lightning—tell me why NASA has part of it and you have part of it, and why it's provided?

Admiral ENGEN. Neal can probably answer that. I've gone to NASA Langley and talked to them about lightning in our cooperative effort, but I think Neal has worked with it.

Mr. BLAKE. NASA has an instrumented aircraft with lightning sensors on it, an F-106, and they've been taking middle altitude and high altitude cloud to cloud lightning data. Now we have an instrumented aircraft which is a Convair 580 and suitable for taking low altitude and some middle altitude data. We have also has the cooperation of the Department of Defense in supplying some of the onboard analysis equipment. So it's a joint tri-agency program.

Admiral ENGEN. NASA does a lot of—NASA and the FAA do a lot of cooperating, Mr. Chairman, and NASA does for us a lot of the basic research such as spins, spin prevention, lightning. They're flying an airplane now with—looking at different kinds of direct control at the cockpit. I think you've probably seen it, but the cockpit is literally at back in the cabin, and people are flying the airplane from the cabin although there are safety pilots up forward.

We also pay NASA to run our aviation safety reporting system. I pay $1.8 million each year so that—that NASA can run that. We have a great cooperative effort. I would like to say in all candor, I would hope that NASA can see its way clear to continue to support those aviation programs which they have in the past.

Mr. MCCURDY. Well, we would like for them to also, and I understand in the lightning area they may not be doing as much work now, and I was aware of it somewhat because of the National Severe Storms Laboratory and the common integrator, I mean they're the ones that understand the meteorology and you all have some of the data. It was just a question. Please proceed.

Mr. BLAKE. Well, on another aspect of the lightning program, we are continuing to study the effect of lightning on aircraft structure, particularly the newer composite structures, and on onboard digital flight control and avionic systems with a view toward developing

updated protection standards. In 1988 a handbook on lightning protection of aircraft will be completed.

Also volume 2 of a handbook on validation of digital systems with high software content operating in these severe environmental conditions will be completed in 1988.

Mr. MCCURDY. That would be my biggest concern. I mean, if you get struck by lightning, you're a fly by wire. That might ruin your day.

Mr. BLAKE. Yes.

Mr. GLICKMAN. There was a Northwest plane from White Plains to Detroit that all of its instrumentation went out. It was recently—it was reported in the New York Times. That was not a lightning strike. It had to be guided by a small Cessna single engine plane because it had no radio, no——

Admiral ENGEN. I'm still looking into that, and I'm sorry to say that I don't have the full particulars but there are some facts that just aren't known at this time. But yes it——

Mr. GLICKMAN. It wasn't a lightning strike as far as you're——

Admiral ENGEN. Not to my knowledge, no sir. I believe it has more to do with electrical problems in the aircraft.

Mr. BLAKE. In the engine and fuel systems area, we're continuing our emphasis on improving engine and fuel system safety and reliability. We're still looking at crashproofing the aircraft and the fuel itself. We've held a workshop with industry to solicit new ideas for fuel protection, and we're in the process of developing a program plan in that area.

In another program, in 1987, we began looking at the suitability of foreign object damage criteria for our medium and large inlet turbo fan engines. We have had some continued damage to these engines as a result of bird strikes. This activity has been expanded to examine the tolerance limits of commuter business executive jet aircraft engines to bird ingestion. And work will continue on determining methods of rotor burst prediction and protection. Component testing will evaluate new concepts in soft wall containment techniques, and new methods of using hard wall deflective materials to protect critical components, and perhaps prevent the type of fire we had in Manchester. Work will also be completed on the winter summer operation of general aviation piston engines operating on auto gas, as well as the effects of fuel aging and hot day aircraft climb performance. This investigation expanded in FY87 to include alcohol-gasoline blended fuels. This whole activity will be completed in 1988.

In the aviation security area, we will continue research in advanced explosive detection systems, an integrated program of improved concourse security with emphasis on plastic handgun detection, and better methods of achieving airport and aircraft security.

Mr. GLICKMAN. Excuse me for a minute. Did you already touch on the fuel issue in the last one and misting fuel?

Mr. BLAKE. Yes.

Mr. GLICKMAN. What's the essence of what you're saying? Are you going to can that program or are you going to——

Mr. BLAKE. No, we have—we did hold a workshop with industry.

Mr. GLICKMAN. Yeah. Okay.

Mr. BLAKE. And we did get a number of suggestions which we have been evaluating and we're in the process of putting together a program plan to define future activities in that area.

Admiral ENGEN. I think we should continue to look at alternative ways of doing that, and that's what Mr. Blake is saying. I know that he is cooperating with the British and we're continuing to have sessions on it. I think it's something we need to keep examining and not give up on it.

Mr. MCCURDY. On the plastic gun and other issues like that on the security, what's the process, what's the ions, what's the ionization, or whatever you call it?

Mr. BLAKE. Well so far as the existing so called plastic handguns, they have enough metal content that with proper operation of the equipment and training you can see those. But we are looking at several items. We have placed major emphasis over the last several years and we're in the process this year of testing at airports an advanced prototype of the thermal neutron activated device.

Mr. MCCURDY. That's what it is. I've got to remember the name.

Mr. BLAKE. The thermal neutron one, has a variety—we have several types of sources, one of them radioactive to generate the stream of——

Mr. MCCURDY. Now how much are you putting in there?

Mr. BLAKE. In dollars for the total program we have about $10 million in the aviation security program total.

The second major activity is the chemoluminescent explosive vapor detection system which we will be testing, field testing during FY88. And a portable vapor detection system will be tried out. That's one that can be carried on the aircraft, and used to sniff, if you will, the entire interior of the airplane.

Other activities would include use of this same technology for screening carry on baggage, as well as passengers. And we will try to combine the vapor sniffing device, if you will, with the standard passenger portal, and look for both metal and explosive vapors.

In addition, we're continuing each year to develop new techniques. We try to pick 2 or 3 new technologies for explosives and vapor detection, and to assess the feasibility of these new technologies, and if any of those show promise, to carry it further into a demonstration phase.

Mr. MCCURDY. Do you work in conjunction with other generic agencies?

Mr. BLAKE. This is a cooperative government activity which involves many laboratories. It involves many of the organizations here in Washington, and we meet periodically as a group to compare notes, to tell them the progress we've made, and we really have the lead role for the government in conducting research in this area, and the results of the research are then used by the other agencies.

Mr. MCCURDY. Okay. I guess in the counterterrorism area this could be a—it's a major issue, and it's something that my other Committee is interested in the intelligence arena and others.

Mr. BLAKE. It also has applications for the custom service as some of the devices are very good at picking up cocaine.

Admiral ENGEN. Mr. Chairman, I'd like to pick up on Mr. Blake's comment there. He's been—being a little modest, but the

agency is really the—the government authority on detection and we work very closely with other agencies and they look to us to continue our work in this area and we're just—we're really putting a lot of effort in.

Mr. MCCURDY. We may have you come in some time and do a special briefing or hearing on that and bring some of your technology and give us an update, because I think this is a very vital area and I don't know how much money the other agencies are providing but $10 million doesn't seem an awful lot in that one.

Mr. GLICKMAN. Mr. Chairman, I just want to reinforce what the administrator says. Several of the airlines have told me the FAA is doing a very fine job, and basically is about the only one that's really taken this issue very seriously, but it's obviously—it's aviation security, so I want to compliment you for that.

I also want to mention something, I don't know if maybe it's some interest to you as well, Mr. Chairman, but last year several of the airlines came to me and said, it is unfair that we should be absorbing these enormous security costs for the airline flights overseas when in fact we get ourselves in the middle of foreign policy disputes and/or terrorist actions, and that then becomes the government's responsibility to protect those hostages once a flight is taken.

And so I came up with the idea, it may not be a very good idea, that we have 300,000 troops stationed in western Europe and what would be wrong with on an ad hoc basis where we use sky marshals now, that maybe we provide additional sky marshals that are really employees of the United States Government vis-a-vis military people. After all we have way more of them than we—than the FAA has Department of Transportation sky marshals and just use a lot, you know, use more of those overseas to provide some help to these carriers that have to pay for these enormous security costs and after, I introduced a bill to do that.

Mr. Schultz and Mr. Weinberger's operations were not very supportive at all because they said they got enough things to do overseas, but I thought to myself, once the plane is taken, then we have to spend hundreds of millions to get the people out of there. Why not prevent—spend a little prevention money to maybe have some of our military people helping you all and the airlines do security?

Admiral ENGEN. I recall your bill, Mr. Glickman, and it was oriented towards airport security to protect those people as opposed to the Federal Air Marshals who are flying in aircraft.

Mr. GLICKMAN. Yes, but it could be either, theoretically——

Admiral ENGEN. Yes, sir.

Mr. GLICKMAN. From a hypothetical point of view.

Admiral ENGEN. We have—it's a very successful—the Federal Air Marshal Program is a very successful program. Indeed the military helped the FAA initially years ago when we had sky marshals, now Federal Air Marshals, and they provided the people in the mid-1970s when we had to man up, but we do man on a visit, revisit, and varied schedule overseas flights that fly wherever U.S. overseas flights, and we do work cooperatively with those governments in those areas in a very determined way.

Mr. BLAKE. In the regulatory area, we have supported this year and next year, the final rule for shoulder harnesses for newly man-

ufactured general aviation aircraft; the seat strength notice of proposed rulemaking which covers new test methods and strength requirements; the cargo compartment liner improvement rule, and the interior panel materials flammability rules, which includes the test device. And our rulemaking support for FY88 will also include small transport general aviation and helicopter seat strength dynamic testing, crash resistant fuel system and analytical modelling in crash situations. So we continue to have an active regulatory support program. The next viewgraph.

[Slide.]

Mr. BLAKE. TJust a few words now in summary of the major FY88 RE&D programs. This viewgraph summarizes the funding for approximately 83 percent of the total RE&D program funding. And the major thrust of the first item, separation standards program, is assessment of the feasibility of reducing vertical separation above flight level 290 to 1,000 feet, from the current standard of 2,000 feet. FY88 activities will result in the completion of an initial data package, which could be used to support rulemaking domestically, and to provide guidance material to the ICAO organization for perhaps international standardization.

The advanced traffic management system and the automated enroute air traffic control system which is called more commonly AERA 3, represent major components of our program to improve productivity in the air traffic control system, both for the users and for the controllers.

In 1988, development of concepts for assisting the flow controllers in selection and management alternatives for resolving congestion situations will be started. The activity to define AERA 3 functions continues in 1989—in 1988, and will be completed in 1989.

The FY88 TCAS funding is in support of the TCAS 2 limited installation program. It will extend through late fiscal year 1988. It will also cover some of the improvements that we talked about earlier.

FY88 VSCS funding will provide for the development of prototype hardware and software. The Terminal Weather Radar Program supports the—the R&D part of it, supports the F&E program for procurement of 17 systems. The R&D portion covers development of additional severe weather products, and these include microburst precursors, turbulence algorithm enhancement, and toronado vortex signature for terminal use.

The NEXRAD program as mentioned earlier, the joint part of the program is for 113 network radars. The R&D funding for 1988 covers development of additional severe weather meteorological products for enroute use. This include icing detection, downburst detection and random storm cross section algorithms, the latter being of a great deal of use in being able to tell the pilots where the safe parts of the storm are.

The wind shear sensor research programs cover development of improved airborne sensors and flight guidance systems. The activity is being conducted as a joint 5 year FAA-NASA program. FY88 is the third year of the program, and will address the effects of heavy rain on aircraft performance and provide an initial flight evaluation of improved forward looking sensor devices. In addition, the feasibility of using ground based laser sensors, which were ini-

tially developed for—by the Air Force, for enhanced gust and microburst detection will also be investigated.

I've already covered the Aviation Safety and Security Program and the funding for the 4 regulatory support activities is shown here. The R&D funding for the advanced automation program covers the inhouse——

Mr. MCCURDY. Sir, Mr. Blake, if I could, on the environment, the aircraft noise and pollution. You have $2.2 million in there. The gentleman from Maryland is not here right now, but he's been an effective advocate for some noise standards, and has certainly raised the issue in regard to Baltimore Airport, BWI, on some of their noise problems, and they have a State plan and all that, and he yesterday asked in the meeting about the Phase II aircraft and the noise levels and the fact that there wasn't a deadline or a target date, and that perhaps we ought to be moving forward. Can you tell us what the FAA is doing there, and perhaps provide in much greater detail for the gentleman from Maryland and the Subcommittee some of the alternatives to the noise problem, and how you see it being resolved in the future?

Admiral ENGEN. Yes, sir. Let me start and Neal, you can pick up on the research and development. In the airport improvement program, AIP, we have money set aside for noise abatement and on a real time basis, we provide soundproofing for schools, hospitals, homes, that fall within the LDN levels around airports that are prohibitive.

Mr. MCCURDY. It does apply to schools? I knew it did for housing. One of the issues—I have traveled with the gentleman, Mr. McMillen, to Baltimore, and one of the problems—it was clear there was a high school almost directly under the flight path. I could almost hit it with a rock from the Tower. It's amazing how close it was. At the time, no one could provide an answer as to whether or not schools and soundproofing would apply and I know his staff is here, but I think that's an important point.

Admiral ENGEN. Where they meet the criteria, we have the funds and those funds are to be used that way.

Under the Aviation Safety and Noise Abatement Act of 1979, we have—Congress has directed that there are specific milestones through which we must pass with respect to aircraft noise, Stage one, two, three aircraft. Probably one of the hardest things that I've done as Administrator was to enforce the Aviation Safety and Noise Abatement Act the first of last year, January 1, 1986, and say there are specific airplanes which cannot fly into the United States or around the United States. We've done that. We are past that. Fortunately, my decisions have been upheld with the courts and now on December 31st of this year, we will pick up another 85 aircraft, DC-9's, 10's and 30's, mostly, some 737's, which will no longer meet the criteria and those airplanes must either be modified or not fly in the United States.

Mr. MCCURDY. You are increasing the criteria each year; is that what you are telling us? You have a phased in approach?

Admiral ENGEN. Not each year but there are specific milestones which we are passing for stages of aircraft. I would be glad to provide that.

Mr. McCURDY. If you would provide that for the record. It is of interest. It does make a difference.

[Information to be furnished follows:]

AIRCRAFT NOISE COMPLIANCE RULES AND EXEMPTIONS

SUMMARY:

The deadline for the operation of Stage 1, civil, subsonic jets of more than 75,000 pounds gross weight to or from any U.S. airport was January 1, 1985.

Some exemptions were issued to 4-engine jets during 1985 and 1986 due to the unavailability of hush kits, but all exemptions for 707/DC-8 aircraft expired December 31, 1986. To date about 147 of these aircraft have been modified with hush kits to meet Stage 2 noise standards.

Also, "small community service" exemptions were mandated by Title III of the Aviation Safety and Noise Abatement Act of 1979 for certain 2-engine turbojet aircraft of 100 seats or less. Currently, 211 such aircraft are exempt, a reduction from 303 on January 1, 1987. These exemptions will all terminate by January 1, 1988. FAA is working closely with the holders of these exemptions to assure that no delays in compliance occur.

MAJOR POINTS.

- FAA noise compliance rule (14 CFR 91.303) was issued in 1976, providing an 8-year period for full compliance (to January 1, 1985).

- In the Aviation Safety and Noise Abatement Act of 1979 (ASNA), Congress directed extension of the compliance deadline until 1988 for 2-engine aircraft with 100 or fewer seats ("small community service exemption"), and urged special consideration for "hardship situations" involving smaller operators of 4-engine aircraft.

- Currently, 37 operators hold small community exemptions for 211 airplanes (mostly DC-9-10/30 and BAC-1-11 airplanes), down from 303 exempt airplanes on December 31, 1986. Hush kits for such aircraft have been reasonably available for many years.

- In 1984, Congress amended the ASNA (Hawkins-Chiles Amendment) because of the unavailability of hush kits for 4-engine jets. The amendment gave special relief to Miami and Bangor, Maine.

- FAA approval has been issued to one supplier of hush kits for Boeing 707-100 and -300 models; 2 suppliers for DC-8-62/63 models; and a supplier may shortly be certificated for DC-8-50 models (Quiet Nacelle Corp.).

- To date, about 147 707/DC-8 aircraft have been modified with hush kits to meet Stage 2 noise standards. The aircraft can be operated without restriction at most U.S. airports.

- During 1984 and 1985, FAA dealt with nearly 150 petitions for exemption. Most involved 707 and DC-8 aircraft. Following court challenges to FAA decisions, exemptions were finally issued to some 40 operators for 74 4-engine aircraft. All such exemptions expired by December 31, 1986.

AEE/4-15-87

Mr. MCCURDY. I saw a 757 yesterday coming to the Hill and I watched it take off from National.

Admiral ENGEN. Isn't that great?

Mr. MCCURDY. It's just incredible. By the time it was over the Washington Monument, it was 4,000 or 5,000 feet, straight up. I couldn't believe it. I was amazed. That's the kind of technology that eventually we would like to see developed.

Admiral ENGEN. Yes, sir.

Mr. MCCURDY. We need to assist them, urge them along the way.

Admiral ENGEN. It only takes money.

Mr. MCCURDY. Yes, well, doesn't everything.

Admiral ENGEN. That's true. Neal, can you add anything more that would apply to what the Chairman asked?

Mr. BLAKE. No, I think you have covered it. We do, within our research and development program, work with NASA, who does all of the aircraft noise reduction research. They have a fairly active program right now on helicopter noise. We are particularly concerned with making the helicopter a more attractive service in congested downtown areas.

Mr. MCCURDY. Well, I would just like to say at this point and we can go quickly through the rest of this, if the Administrator would work with the gentleman from Maryland and perhaps assist him in looking at some of the alternatives and perhaps your office could help pave the way to at least work through some of their difficulties. I would appreciate it.

Admiral ENGEN. All right.

Mr. BLAKE. Continuing, the central weather processor R&D funding provides for the continuing development of the prototype. That is still in the R&D phase, and for the definition of future system interfaces which include lightning detection systems, the National Weather Service's AWIPS 90 system, Terminal Doppler Weather Radar, wind profiler, traffic management system, and the weather communications processor.

The system capacity program is one that covers development of parallel runway sensors with an automatic aircraft deviation monitor and demonstrations are planned at Memphis and Raleigh/Duram airports during FY 1988.

In FY 1988, the terminal air traffic control automation activities will address development of controller aids for descent advisories and final spacing assistance and represent perhaps the first really major attempt at automation of the terminal functions.

The airport technology program encompasses activities to assess airport capacity, develop improved airport designs and configurations, provide improved methods for bird and wildlife control, a continuing problem, and provide improved airport and heliport lighting and marking systems, evaluate new fire fighting chemicals, develop all weather taxiway guidance, evaluate aircraft ground performance pilot advisory systems, develop improved pavement construction and repair materials and techniques.

Mr. GLICKMAN. Excuse me, Mr. Blake and Admiral Engen, is this program in any way, the airport technology program, dealing with the hub airport problems that resulted in connection with deregulation and this over utilization of certain airports in this country?

Admiral ENGEN. In all of our airport programs, Congressman Glickman, there is intertwining and there are strong implications in our research and development for amelioration of the delay problem out there. I want to keep specifically towards the Airport Capacity Office in the FAA which comes under the Associate Administrator for Airports, where we deal in real time with computer models, the Jolene model and other models, looking at high speed turn off and ways to improve the throughput of air commerce.

Neal, do you want to add anything to that?

Mr. BLAKE. No. Our efforts are in support of the Airport Capacity Office and the major activity is to achieve capacity increases at perhaps some 13 airports by providing the equipment necessary for simultaneous close spaced parallel runway approaches down to 3,000 foot runway center line separation.

Mr. GLICKMAN. That's closer than——

Mr. BLAKE. Today, it is 4,300 feet.

Mr. GLICKMAN. The other thing is I noticed a lot of airplanes now are using the reverse thrust to pull out of the gate as opposed to being pushed back. That was a phenomenon five years ago I never experienced. Now it is happening all the time.

I assume there is nothing wrong with that because they do that when they land anyway, but you listen to that noise, that incredible noise as you are reversing and you can't help but think, is that going to cause severe engine maintenance problems, are we over utilizing engines, that was never anticipated when these engines were originally built.

Admiral ENGEN. Each pilot, of course, is required to monitor the exhaust gas temperatures and you don't over temp an engine. It is working. It is within the design limits of the engines and the after burners. They must be inspected periodically. If we find that because of this practice, there is any deterioration, it would show up on the normal inspections. It's working. It's working. It is unusual.

Mr. GLICKMAN. These engines were not—when these planes were built, the engines put on there, I don't think that was part of the original specifications, to use it to back out.

Admiral ENGEN. Yes, sir.

Mr. BLAKE. In the wake vortex program, the 1988 activities include validation of a wake vortex model that will permit us to classify new aircraft as to their wake vortex classification without needing to have extensive and expensive flight tests.

In addition, systems to determine vortex life as a function of atmospheric stability will be evaluated and establishment of rotor craft classes and separation minimums will be completed.

Automatic dependence surveillance is a relatively new program. It relates to the use of automatic reporting of aircraft navigation position which will permit the use of quasi-radar procedures in low density and oceanic air space. The FY 1988 activities will complete definition of functional and operational concepts for oceanic and domestic air space as well as definition of communication requirements to support this service.

In the FY 1988 data link program, the proposed initial data link applications will be tested and evaluated and these functions include the initial weather services. Pilot and controller human factors programs are covered by this next item. The pilot human fac-

tors activities will address the pilot/air traffic controller system interactions on both TCAS and data link functions. They will also address improved general aviation biannual training and evaluation of updated pilot workload measures.

Application of expert system technology to improve aircraft pilot warning flight management systems will be initiated.

In the controller human factors area, activities will be initiated to define controller functions in the current and future systems, operational scenarios and workload models. This activity supplements controller evaluations of man/machine interfaces that are being conducted as a part of the advanced automation system program.

Thank you.

[Information to be furnished follows:]

Aircraft Safety and Security

- Fire Safety
- Crashworthiness
- Flight Safety
- Propulsion Safety
- Aviation Security

Fire Safety

- FY 1988 Programs
  - -- Recommendations on Improved In-Flight Fire Protection
  - -- Evaluation of Improved Smoke Venting Procedures
  - -- Evaluation of Computer-Based Fire Management Systems
  - -- Improvement in Fuselage Burn-Through Resistance

Crashworthiness

- FY 1988 Programs
  - --Commuter Aircraft Survivable Impact Definition
  - --Characteristics of Advanced Composite Materials, Including Impact, Failure, And Damage Growth Characteristics
  - --Modify Analytical Techniques for Use In Composite Aircraft Crash Impact Analysis
  - --Technical Data to Assist FAA Personnel In Assessing the Performance of Composite Material

Flight Safety

- FY 1988 Programs
  - --Icing Atmosphere Characterization
  - --Aircraft Icing Handbook
  - --Icing Instrumentation Calibration Standards
  - --Lightning Characterization
  - --Update of Lightning Protection Handbook
  - --Digital Systems Validation Handbook

Propulsion Safety

- FY 1988 Programs
  - --Foreign Object Criteria for Medium and Large Inlet Turbofan Engines
  - --Rotorburst Prediction and Containment
  - --Effects of Auto Gas In General Aviation Piston Engines

Aviation Security

- FY 1988 Programs
  - --Advanced Explosive Detection System Evaluation
  - --New Technology Investigation
  - --Improved Concourse Security
  - --Airport and Aircraft Security Systems

Major FY 1988 R,E&D Programs

• Separation Standards (Includes FL-290)	$ 3.0M
• Advanced Traffic Management	1.8
• Automated En Route ATC	6.2
• TCAS (TCAS II)	2.5
• Voice Switching and Control System Development	36.0
• Terminal Weather Radar	1.2
• NEXRAD	1.9
• Wind Shear Sensor Research	1.6
• Aircraft Safety (Excluding Aviation Security)	10.5
• Aviation Security	11.0
• Aviation Medicine	4.3
• Environment (Aircraft Noise/Pollution)	2.2
• Advanced Automation Program (AAS)	7.7
• Central Weather Processor	14.7
• System Capacity	3.4
• Terminal ATC Automation	1.9
• Airport Technology	4.9
• Wake Vortex	1.0
• Automatic Dependent Surveillance	2.0
• Data Link	5.2
• Pilot/Controller Human Factors	1.6

Mr. McCURDY. Very good, Mr. Blake. Gentlemen, I'm not going to keep you much longer. We have had a very productive afternoon.

I have a few general questions though. Admiral, in the Administration's proposed Trust Fund legislation, RE&D is set at a flat rate of $150 million for FY 1988 and 1989. As you indicated, you would like to see some growth, in that 2.5 percent of the total budget is not adequate for the responsibilities that this Agency has.

The user groups yesterday that testified indicated they thought it ought to be at least $225 million. Will you tell us, was there any pass back or did OMB—what was your request and what did our good friends downtown say on the research and development?

Admiral ENGEN. Let me address it this way first, Mr. Chairman, if I can. The $150 million that is in our FY 1988 budget, I said I felt we could live with in the year 1988 because, and I left this unsaid because I feel that as we move to the production phase in the National Airspace System Plan, those monies being spent for NAS are becoming available to be used for other things other than NAS. As it moves into F&E, it gives us some flexibility.

Now, to answer you truthfully and honestly, our initial submit was for $205 million. It was the subject of great discussion in the budget process. You have a lot you have to do in the Agency with respect to F&E, with respect to airport improvements, with respect to operations, and it was finally determined that we would go forward with $150 million.

I support that for the year 1988. I stand by my words. I do believe we should devote more to research and development in the FAA in the future.

Mr. McCURDY. The Administration requested a two year authorization here. I support the two year authorization. I was the author of the amendment in the House for the DOD moving to a two year authorization. Here it is a little different though. You have Public Works looking at the longer period.

Why did they say two years?

Admiral ENGEN. If you look at our FY 1988 budget, you really will see what I have been working for for the last 18 months as the first year of a five year authorization. A two year authorization, I feel, at this time, is a valid concept. It doesn't mean the funding is going to stop after two years. It just means we have to start now and build to the next follow on or five year authorization. I view it as the first year, 1988, first year of a seven year authorization.

The funds that are there and supported by the Department of Transportation, I might add, very strongly are those needed to get us where we want to go, whether it is a two year authorization or a five year authorization. I was very pleased with those funding levels.

Mr. McCURDY. With the NAS Plan, since there is a certain level of fluidness or fluidity or volatility or whatever you want to call it in some of the contracts and their problems, would it not be better to have a shorter period, two years, as opposed to five, in that area?

Admiral ENGEN. Well, I think you want to plan ahead. We budget on a yearly basis regardless. The authorization, of course, goes for a period of time. That allows us to achieve our budget

goals. Whether it is two years or five years, I think we are going to get there. Two years does let you look at the short term, and I wouldn't sit here and say to you, sir, that I think it is going to end after two years. I know there is going to be another follow on authorization.

I would favor going to a five year authorization as a follow on to this two year.

Mr. McCURDY. Well, I understand that Congress plays a role in cost growth also and I have chaired some procurement panels in DOD. We can micromanage too much. I don't argue except in those areas where I think there should be some effective oversight. I for one argue that you can provide that with a longer authorization, you just have to put the E on the TBPS which is what it used to be in defense and that's the evaluation phase, and we need to do more of that.

Let me switch subjects on you. Given CAMI's role in designing tests for use in selecting applicants and performance tests for screening potential controllers during training, what thought have you given to sharing that expertise with other agencies?

Admiral ENGEN. Dr. Jordan is Acting Federal Air Surgeon. He is sitting behind me on my right. Let me say with respect to drug screening, which I think that is what you are talking about, is it not?

We are using a contract, Compuchem, an outside agency under contract to us, to perform the validity of those tests and keep it at a specified success level, if you will. CAMI is not manned or equipped to handle the volume—excuse the expression—of urine that would flow towards it. They would be inundated. While CAMI sets standards and we look to CAMI for toxicological examinations and for a lot of very, very valuable work, they are not our drug testing agency.

Mr. McCURDY. Well, they do also psychological, I think, there are a number of areas, and it is just not drugs. As you know, you and I both recently visited the Monroney Center in Oklahoma City. I was concerned that CAMI's role was shifting away from protection and survival research and human performance research to more the analytical number crunching role. That disturbed me. They would admit that has been the thrust.

Can you account for this apparent shift? Is that in the long range plans?

Admiral ENGEN. Let me say that I believe very strongly in the role of the CAMI and aeromedicine, having been raised in that tradition and taking my initial comments about human factors and how important they are to prevention of accidents. Our goal is to have CAMI used in a much more active role.

When I was at CAMI last, it was about a week after we had visited, I was able to witness a side restraint system for a passenger sitting in a general aviation airplane that was sitting sideways and we sat them down and gave them 21 G's and you saw the pool there and the dummies we have. We are doing a lot of things. I think we need to do more. It would be my goal to enhance the role of CAMI. You know, it is a magnificent facility.

Mr. McCURDY. They have plenty of space. It is one of the areas of Government where you actually have the room and the capability.

I was hoping—I applaud your comments and certainly you would have great support here. I was curious how you balance the roles of CAMI and the Technical Center in Atlantic City in that human factors research and coordinate that and make sure that work is done and utilize the facilities you have.

Admiral ENGEN. Absolutely. In human factors, it must be oriented towards CAMI. However, the Technical Center needs to look at the human factors involved in the man/machine interface, if you will. We are about to start on a very broad program in addressing human factors across the board, not only in research and development, as Mr. Blake has shown us here and at CAMI, but at the Technical Center. We need to get into the human mind more. We need—I wouldn't want to say it must all be done at CAMI. They will certainly have a major part of the role and that will be where most of the human factors will be done.

We ought not to just crunch numbers. We ought to be experimenting. We ought to be trying to improve things and it is the perfect place to do it.

Mr. MCCURDY. One last question. Normally in Armed Services, we ask the Secretary, if your budget was cut, what areas would you have—where would you cut, where would you make those savings. I am going to reverse it.

If Congress were to restore some of the funds in the R&D area to your request level or somewhere in that area, what would be some of your priorities of restoring funding?

Admiral ENGEN. Well, when I first made my rather informal comments, I talked about the need for additional work in security. This was brought out in your questioning of Mr. Blake. I think we have to look at our method of maintaining airmen certification. We have to expand that in some research and development support.

Passenger protection, just what we were talking about just now. Airport configuration, by our figures here, that is a little over $4 million going into that right now, but I would put more money into airport configuration and noise. Air pollution is another area which I believe we should look closely at the standards required for air pollution. Lastly, I would put money into cockpit configuration. We are developing glass cockpits today.

Congressman Glickman mentioned this aircraft that had a problem electrically. I'm not fully sure yet what happened. I want to be sure that the glass cockpit technology that we have is totally functional. I want to be sure we are not drawing pilot's eyes into the cockpit, just when they should be looking outside.

These are some of the areas.

Mr. MCCURDY. This goes back to a tech transfer issue, I mean those are issues that we spend a great deal of time on the Research and Development Subcommittee in Armed Services, and I've been through so many simulators that it would make your head swim in the military area. I don't understand why we cannot translate more of that technology into the civilian sector. It is applicable and it doesn't have to be in targeting but it could be an approach in other areas. I'd like to see some money directed in that direction.

Admiral ENGEN. May I say, sir, we do have good cooperation between the military and the civilian, and much of what we have done particularly in moving from the piston engine era of the

1940's to the jet era of 1957 and subsequent, traded upon that technology you are talking about.

We should continue to use everything we have and use that transfer of technology.

Mr. McCURDY. The gentleman from Maryland has joined us. As I indicated earlier, he is very interested in the noise issue. The Admiral just indicated, Mr. McMillen, that if there were additional funding in this budget, that one of the areas that he would like to see some emphasis was on noise abatement and air pollution changes. He also indicated or responded to a question I had earlier about some of the $2.2 million R&D funds under that category, that there was also funding in the airport improvement program for noise abatement, insulation for schools. I pointed out the problem with the high school near the airport in Baltimore. I said you could hit it with a rock. He might be able to dunk it from the Tower. He can almost reach it.

The Administrator also indicated that his office and Agency would be willing to work with you directly to assist in addressing some of the needs in your area.

With that preface or predicate, I would recognize the gentleman from Maryland.

Mr. McMILLEN. Thank you very much, Mr. Chairman. I'm sorry I am terribly late. I know you are wrapping up and the hour is late. We were in a mark-up in another Committee.

As was mentioned, we had a visit to Baltimore Washington Airport about a month ago and really saw some of the human tragedy involved with noise. Clearly, this is not a problem that just affects Maryland. It is all over the country. I get it both ways because I represent Oxon Hill which is sometimes over the flight paths of National Airport.

I just really wanted to come by. I pursued some questions yesterday that were relevant to this issue. Maybe you could just give me a five minute summation as to what can be done in this regard. I appreciate your offer to help individually in this case.

In BWI, we have a problem that is exacerbated by the fact that there is 3,000 acres constrained by lots of development around it, primarily residential, and all of a sudden, that area has just taken off and they needed an airport and there is no place for it to go and more and more flights are being put into that airport day after day.

The tragedies are very, very real. As our Chairman said, there is a school that is not air conditioned. It has to keep its windows open in the spring and fall. It's just a terrible condition. I would just appreciate your comments.

Admiral ENGEN. Thank you, sir. Noise probably is the most pervasive issue in the United States in the 1980s.

Let me start, please, by saying that first there is created an airport. Usually it is created way out of town, with no surrounding property built up at all, and people feel very comfortable with that airport out there. Then comes commerce. Airlines begin to fly there, begin to bring people, gas stations are built, shopping centers, homes come, and really in the planning cycle of a community, the airport isn't realized as a valuable commodity in the community until it is too late and it is, indeed, surrounded by schools, by

churches, by homes, and then we come to where we are today in many communities where people are having to decide what to do with their airport.

That airport is an economic generator. For instance, the three airports in New York City, La Guardia, John F. Kennedy and Newark, generate $17 billion worth of revenue each year for that city. That is a lot of money. A community needs to get its priorities together and decide whether that airport is the economic generator that they need for their community to grow because if you don't have an airport, your city will begin to die.

I don't need to give you a lecture, and please don't view this as a lecture, but you are talking to the person who holds the standards of aviation.

So we have come up with ways, Congressman McMillen, where we can help the community with respect to noise. In the Airport Improvement Program, we have money set aside where we would dedicate to you, and we are working in real time with BWI to try to help those people who are disadvantaged—and you used the word "tragedy"—near the airport, while the community can best decide how it wants to zone and what it needs to do.

I will continue to provide those monies. I am very interested in doing that. We do it in other cities as well, and we are working in real time with your community, and I just want to assure you of my full cooperation, and I would like to sit down with you and see what we can't do that would address your personal concerns.

Mr. McMillen. I would appreciate that. Yesterday in the hearing there was an idea. We are sometimes dealing on the margins with this issue because unless you really deal with it on a national basis, it is going to be quite meaningless.

One of the ideas was—even in our area we have seen some developers building into these areas even with the full recognition of the growth and expansion of the airport. What is your thought of the idea brought up yesterday that within a five mile radius of any airport in this country, any real estate contract has got to very clearly put that into the contract so that there is clear recognition by both parties as to the risk involved there?

Admiral Engen. I think that is an admirable step. I really do. I think that it will begin to place the emphasis on that economic generator, which the city needs. We find it just follows—Dulles is a good case in point. Dulles already is being surrounded by buildings out there, just the same kind of buildings that we are talking about here. Dulles' days are numbered. People don't recognize that, but it won't be long until Dulles is surrounded just like everything else.

So, wherever the airport is, whether it is BWI or Dulles or Hartsfield in Atlanta, we need to place some kind of building code in place that people will understand when they buy property what it is that they may face.

Mr. McMillen. I would be interested in the Chairman's thoughts. Do you think that is something that should be done nationally, a national preemption or a national clause to that effect, in your experience?

Mr. McCurdy. That is a tough question because I am thinking of jurisdictional issues, where that would lie, and I am not exactly sure where that would. Public Works would probably come as close

as any. I am sure John Dingell wouldn't shrink at taking it in the Commerce Committee. He doesn't shrink most of those responsibilities.

Admiral ENGEN. Perhaps I could help. The FAA doesn't go around the world or the United States and say put an airport here or put an airport there. We go to the community. We allow the community to come to us. Not allow; we ask the community to come to us and ask us where they want to put the airport. Then we begin to help.

So from my perspective as Administrator, I would like to see the cities address the problem, and I would like to help them.

Mr. MCMILLEN. You point out Dulles, and I have flown into a lot of airports in this country. In the case of Dulles, that was an airport that was built really out into the country. There were not a lot of surrounding communities at the time, and all the commercial infrastructure really came after the airport.

People saw what was coming, so there are no surprises there. In Baltimore-Washington Airport, those communities were there. They have been there. Those people moved there with a certain size airport in mind. What has happened is the state made a decision that they wanted to expand that, much to the opposition of those communities, and what has happened is that it wasn't that they had any choice. They are there, and I think part of the priority of that whole airport improvement program has got to be dealing with those people who were there a long time before these massive expansions came into being.

That is a clear delineation in the case of Dulles and delineation of differences with the case of Dulles that you mentioned.

Without belaboring this point because I know it is late, is there something that we can do about the calibration of noise? One of the complaints that I hear is that during peak hours, it is just horrible out there and that you are registering these noises on an average basis rather than a peak basis, under 65 decibels or so forth.

Is there a way that we can look at that any home that is also in a peak decibel range would have some remedy for assistance under these?

Admiral ENGEN. There are noise programs and noise measurement programs, Congressman McMillen, that are very standard. I find that sometimes they are administered in a non-standard way, and what you need to do, what the airport authority needs to do, and the FAA would help, is to set the standard out there, go out and explain to the local community what the standard was, how you measure this noise, and then set about with a program which you are talking about.

Not too long ago, three years ago, we were having a very hard time with noise at Washington National and we did a program like that, and at that time we had a scatter plan, which was a total disaster. Everybody didn't enjoy it, and I set about to put that in order and to have fixed paths over the least populated areas. All people are not happy, but the majority of the people feel that that has taken care of that.

With the advent of MLS, which is a microwave landing system which allows curved approaches and is in the offing, we are building them now, and hopefully they will be in places. There are flight

patterns that may be used that would be different from the flight patterns that are there right now.

I don't say that this is a total fix, but there are a lot of things that can be done. So not only do we need to have——

Mr. McMILLEN. The testimony that I heard yesterday might have contradicted that in the sense that the MLS systems that were discussed, they said don't count on a lot of noise abatement from those systems. They said the real way to deal with this is to either move the people or to deal with the source of energy.

I guess other than the kind of real estate notions of trying to stop any further development and also trying to move towards the Stage 3 and quieter aircraft as quickly as possible, I don't have any magical solutions to that, but I appreciate the chance at least to hear your thoughts.

I think instead of continuing on this course, I would like to meet with you individually and talk about that.

Thank you.

Admiral ENGEN. Very good. I would look forward to that, sir.

Mr. McCURDY. I thank the gentleman from Maryland.

We thank each of you today for your appearance and your testimony. There will probably be a few questions submitted for written responses from the staff, and again, we appreciate the time you took this afternoon.

We stand adjourned.

[Whereupon, at 4:30 p.m. the hearing was concluded.]

OVERSIGHT ON THE FEDERAL AVIATION ADMINISTRATION FISCAL YEAR 1988 RESEARCH, ENGINEERING, AND DEVELOPMENT BUDGET REQUEST

THURSDAY, APRIL 23, 1987

HOUSE OF REPRESENTATIVES, COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY, SUBCOMMITTEE ON TRANSPORTATION, AVIATION AND MATERIALS,

Washington, DC.

The subcommittee met, pursuant to notice, at 2:05 p.m., in Room 2325, Rayburn House Office Building, the Honorable Dave McCurdy (chairman of the subcommittee) presiding.

Mr. MCCURDY. Good afternoon. Today the Subcommittee will conclude its hearing on the FAA, covering both the research programs and the long range plan for modernizing the air traffic control system, the NAS Plan.

We are pleased to have Mr. James Burnley, Deputy Transportation Secretary as our witness today. Mr. Burnley is a key decision maker involved in virtually all important policy, procurement, budget and personnel issues affecting the FAA. He is also an articulate spokesman for Administration policy as it relates to air transportation.

This is the year for reauthorizing expenditures from the Trust Fund, a process that is extremely important to everyone who uses the air system and is concerned about its safety or the seemingly endless delays encountered by air travelers. If you have any questions about that, go to my district sometime. It's hard to get back and forth.

Mr. Burnley is playing a major role within the Administration in dealing with these concerns. We are delighted he could join us today to add his perspective to those of the users and the FAA which we heard at our previous hearing.

I understand Mr. Lewis will be joining us shortly. There is a request, I understand, for some photographs or still photography during the hearing, and without objection, it will be allowed.

Mr. Burnley, it is a pleasure to have you here today. I look forward to hearing your views on a number of issues. I think that the Subcommittee will certainly learn a great deal and I think it is important that we have the record clearly state the views of the Administration. I think your presence today will go a long way in clearing that record and having that clearly stated for the policy considerations that we have before us and in the years to come.

[The prepared statement of The Honorable Dave McCurdy follows:]

HONORABLE DAVE MCCURDY, CHAIRMAN
SUBCOMMITTEE ON TRANSPORTATION, AVIATION AND MATERIALS
COMMITTEE ON SCIENCE, SPACE AND TECHNOLOGY

APRIL 22, 1987

FEDERAL AVIATION ADMINISTRATION
FY 88 RESEARCH, ENGINEERING & DEVELOPMENT AUTHORIZATION

TODAY THE SUBCOMMITTEE WILL CONCLUDE ITS HEARINGS ON THE FAA, COVERING BOTH THE RESEARCH PROGRAMS AND THE LONG-RANGE PLAN FOR MODERNIZING THE AIR TRAFFIC CONTROL SYSTEM -- THE NAS PLAN.

WE ARE VERY PLEASED TO HAVE MR. JAMES BURNLEY, DEPUTY TRANSPORTATION SECRETARY, AS OUR WITNESS TODAY. MR. BURNLEY IS A KEY DECISION MAKER, INVOLVED IN VIRTUALLY ALL IMPORTANT POLICY, PROCUREMENT, BUDGET AND PERSONNEL ISSUES AFFECTING THE FAA. HE IS ALSO AN ARTICULATE SPOKESMAN FOR ADMINISTRATION POLICY AS IT RELATES TO AIR TRANSPORTATION. THIS IS THE YEAR FOR REAUTHORIZING EXPENDITURES FROM THE TRUST FUND, A PROCESS THAT IS EXTREMELY IMPORTANT TO EVERYONE WHO USES THE AIR SYSTEM AND IS CONCERNED ABOUT ITS SAFETY OR THE SEEMINGLY ENDLESS DELAYS ENCOUNTERED BY AIR TRAVELERS. MR. BURNLEY IS PLAYING A MAJOR ROLE WITHIN THE ADMINISTRATION IN DEALING WITH THESE CONCERNS. SO WE ARE DELIGHTED HE COULD JOIN US TODAY TO ADD HIS PERSPECTIVE TO THOSE OF THE USERS AND THE FAA, WHICH WE HEARD AT OUR PREVIOUS HEARING.

STATEMENT OF JAMES H. BURNLEY IV, DEPUTY SECRETARY, U.S. DEPARTMENT OF TRANSPORTATION, ACCOMPANIED BY JANET HALE, ASSISTANT SECRETARY FOR BUDGET AND PROGRAMS AND JON SEYMOUR, ASSISTANT SECRETARY FOR ADMINISTRATION

Mr. BURNLEY. Thank you, Mr. Chairman. Thank you for those kind words. I will make sure that I am sufficiently articulate and get my facts straight.

I brought with me today Janet Hale, our Assistant Secretary for Budget and Programs and Jon Seymour, our Assistant Secretary for Administration, and to make sure we don't stray, we have in the back, Marty Pozesky and Neal Blake, who appeared with Admiral Engen about this time in March.

Mr. MCCURDY. Did you bring his view charts?

Mr. BURNLEY. We have the view charts, Mr. Chairman. If you insist.

Mr. MCCURDY. No; that's quite all right. I've seen enough.

Mr. BURNLEY. I do really appreciate the opportunity to appear before the Subcommittee today. I have some brief prepared remarks, and if I may, I will go ahead now. Again, it's good to be here to describe the Department's commitment to furthering the research and development activities at FAA.

Your letter of invitation for this hearing also asked that I address the funding profile for the National Airspace System Plan that is contained in our proposed two year renewal of FAA programs funded by user fees that are deposited into the Airport and Airway Trust Fund.

In today's highly competitive world economy, shortsightedness in research and development investments can be one of the most significant mistakes made by management. This is true in Government as well as in the private sector. This truth is particularly important for a highly technical agency such as the FAA.

Administrator Don Engen and Secretary Dole have placed a high priority on the FAA's research, engineering and development or RE&D funding to advance aviation safety and efficiency.

When the Reagan Administration proposed and the Congress adopted the National Airspace System Plan in 1982, we were fully cognizant of the immense R&D challenge that accompanied that plan. Complete modernization of the U.S. air traffic control system involving the advanced automation program, automated weather observation, voice switching and control systems, and terminal doppler weather radar among many other new technological applications, must be guided by a comparable commitment to research.

As an element of the NAS Plan announced in 1982, we advocated and Congress adopted an increased level of RE&D authorizations. To just briefly reiterate, we got authorization for that account of $134 million for fiscal year 1983; $286 million in 1984; $269 million in 1985; and then back down to $215 million in 1986 and $193 million in 1987.

These authorizations, Mr. Chairman, total $1.097 billion for that period. For that same period, the Administration requested appropriations totaling $1.074 billion, only $23 million less than author-

ized. The Congress appropriated a total of $46 million less than we requested.

With phase one of the NAS Plan now moving toward the hardware installation phase, the related R&D effort is nearing completion, allowing us to increase the emphasis on the FAA's safety, environmental and other air traffic research and development.

Overall, as you know, the fiscal year 1987 RE&D level appropriated for FAA by the Congress is $142 million and the Administration seeks an increase for next year, fiscal year 1988, to $150 million.

The Administration's 1988 request seeks increases in 6 of the 7 major RE&D program areas, when compared with the average annual amounts committed to each of those areas over the last 6 years.

Specifically, air traffic control will be up compared to that average from $62.7 in 1988, now requesting $89 million. For aviation safety, we would like to go to $21.4 million from an average of $16.5. Aviation medicine would go up to $4.3 million from an average of $3.9 million. Aviation weather research and development would be up to $18.3 million from an average of $10 million. Navigation related R&D would be at $6.7 as compared to an average of $6.1 million. The category covering environmental issues would go to $2.2 million from $1.7 million.

The only program area decreasing is the one covering advanced computer hardware and software technology. In fiscal year 1988, about $7.7 million would be spent for that purpose under the Administration's request, while an average of $78.6 million has been dedicated to this area over the past 6 years. The bulk of this funding was spent during the design competition phases of the host computer and the advanced automation systems, when new computer capabilities had to be developed in advance of our actual procurement and production.

Comparing FY 1987 alone to the FY 1988 Administration request, the Administration seeks an overall increase of about 6 percent in the FAA's RE&D funding. This increase from the 1987 levels in times of overall serious budget constraints I think demonstrates our commitment and understanding of the need for aviation research and development.

With respect to the concern expressed in your letter about our commitment to future air traffic control needs, I believe the FY 1988 requested increase for air traffic control R&D, which we would expect to continue in FY 1989, is the best evidence that our emphasis on this area will not lag as the NAS Plan is implemented.

I would like to review for you, if I may for a moment, just a few of the non-NAS Plan R&D activities the FAA plans to undertake, to address important aviation issues such as enhancing the capacity of the system. This is one of Secretary Dole's as well as Administrator Engen's highest priorities.

Together with the aviation industry, the FAA has identified a number of concepts that may increase airport capacity, improve safety and reduce delays. One project that we consider very promising following study in this fiscal year, a project on independent approaches to dual runways using a 3,000 foot centerline spacing, will

now permit a landing monitor concept to be selected and development started in the next fiscal year for these types of runways.

Also, the new RE&D funding will allow the FAA to begin defining and selecting other promising concepts for independent instrument flight rule approaches to other site specific runway configurations.

The FAA will also continue to analyze and validate the current U.S. and international airspace separation standards, in recognition that the capacity of the ATC system depends to a large extent on the standards used to ensure safe separation of air traffic. This very important research may lead to new standards of separation but always consistent with maintaining the highest levels of operating safety.

Other capacity improvement initiatives include the development of a concept for the advanced traffic management system, to allocate as efficiently as possible traffic demand to available system capacity. An automatic dependent surveillance system, for use in improving the monitoring and control of aircraft over oceanic airspace, is one more promising technology that can relieve the current burden on our air traffic management resources.

I would stress one other area of FAA research of particular importance to Secretary Dole's emphasis on safety. This is the research that would address the problem of runway incursion incidents. We are developing improved automation tools to alert the controller of potential conflicts on airport surfaces and we are exploring enhancements to existing airport surface detection radar to provide automatic radar tracking and target classification.

Our requested increases will be scrutinized anew in the congressional budget and appropriations process. I urge the aviation and R&D leadership in Congress and of course, most particularly this Subcommittee, to defend our request of $150 million, which will be in the balance with all the other competing needs throughout Government as this year's budget and appropriations process proceeds.

The House's recent adoption of a budget resolution freezing FAA at FY 1987 levels, with further potential reductions to absorb an undistributed $800 million reduction in transportation programs, clearly puts our RE&D request at risk, along with the overall 20 percent requested increase for the FAA that would provide among other things, for more air traffic controller and safety inspector positions.

Turning for a moment to our FY 1988 and 1989 NAS Plan request, the Administration proposal keeps the NAS Plan on target with an increase in expenditures between FY 1987 and 1988 alone of 68 percent, to $1.35 billion, and a further increase to $1.5 billion in FY 1989.

To date, NAS Plan achievements have been substantial. Fourteen percent of the NAS Plan projects are already complete and over 75 percent are under contract. Approximately 4,400 individual equipment components have already been delivered to the field. By the end of this fiscal year, 90 percent of the NAS Plan program will be underway. While modernizing the system, we will also be spending money on maintaining the large capital plant that we already have in place.

In sum, I believe our FY 1988/1989 request seeks all that we can wisely spend to implement the NAS Plan during those two years. However, the Congress must fully fund these requests if delays caused by fiscal shortfalls are to be avoided. We have been able to keep the NAS Plan on course despite the fact that Congress has appropriated $943 million less than the Reagan Administration requested for the NAS Plan over the last 6 years, but the country cannot afford another year of dangerously shortsighted policies that sacrifice upgrading of the air traffic control system to offset huge subsidies for new mass transit systems, regardless of need, and to subsidize middle class as well as wealthy Amtrak passengers.

That, Mr. Chairman, completes my prepared statement. Ms. Hale and Mr. Seymour and I are happy to answer any questions that we can.

[The prepared statement of Mr. James H. Burnley follows:]

STATEMENT OF THE HONORABLE JIM BURNLEY,
DEPUTY SECRETARY OF TRANSPORTATION
BEFORE THE
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
SUBCOMMITTEE ON TRANSPORTATION, AVIATION, AND MATERIALS,
CONCERNING AVIATION RESEARCH AND DEVELOPMENT IN FY 1988
April 23, 1987

MR. CHAIRMAN AND MEMBERS OF THE SUBCOMMITTEE:

I APPRECIATE THE OPPORTUNITY TO APPEAR BEFORE THE SUBCOMMITTEE TODAY TO DESCRIBE THE DEPARTMENT'S COMMITMENT TO FURTHERING RESEARCH AND DEVELOPMENT ACTIVITIES AT THE FEDERAL AVIATION ADMINISTRATION. YOUR LETTER OF INVITATION ALSO ASKS THAT I ADDRESS THE "FUNDING PROFILE" FOR THE NATIONAL AIRSPACE SYSTEM PLAN CONTAINED IN OUR PROPOSED TWO-YEAR RENEWAL OF FAA PROGRAMS FUNDED BY USER FEES DEPOSITED INTO THE AIRPORT AND AIRWAY TRUST FUND. WITH ME TODAY ARE JANET HALE, ASSISTANT SECRETARY FOR BUDGET AND PROGRAMS, AND JON SEYMOUR, ASSISTANT SECRETARY FOR ADMINISTRATION.

IN TODAY'S HIGHLY COMPETITIVE WORLD ECONOMY, SHORT-SIGHTEDNESS IN RESEARCH AND DEVELOPMENT INVESTMENTS CAN BE ONE OF THE MOST SIGNIFICANT MISTAKES MADE BY MANAGEMENT. THIS IS TRUE IN GOVERNMENT AS WELL AS IN THE PRIVATE SECTOR, AND THIS TRUTH IS PARTICULARLY IMPORTANT FOR A HIGHLY TECHNICAL AGENCY SUCH AS THE FAA. ADMINISTRATOR DON ENGEN AND SECRETARY DOLE HAVE PLACED A

HIGH PRIORITY ON THE FAA's "RESEARCH, ENGINEERING, AND DEVELOPMENT" OR "RE&D" FUNDING TO ADVANCE AVIATION SAFETY AND EFFICIENCY.

WHEN THE REAGAN ADMINISTRATION PROPOSED, AND THE CONGRESS ADOPTED, THE NATIONAL AIRSPACE SYSTEM PLAN IN 1982, WE WERE FULLY COGNIZANT OF THE IMMENSE R&D CHALLENGE THAT ACCOMPANIED THAT PLAN. COMPLETE MODERNIZATION OF THE UNITED STATES AIR TRAFFIC CONTROL SYSTEM, INVOLVING THE ADVANCED AUTOMATION PROGRAM, AUTOMATED WEATHER OBSERVATION, VOICE SWITCHING AND CONTROL SYSTEMS, AND TERMINAL DOPPLER WEATHER RADAR AMONG MANY OTHER NEW TECHNOLOGICAL APPLICATIONS, MUST BE GUIDED BY A COMPARABLE COMMITMENT TO RESEARCH. AS AN ELEMENT OF THE NAS PLAN ANNOUNCED IN 1982, WE ADVOCATED AND CONGRESS ADOPTED AN INCREASED LEVEL OF FAA RE&D AUTHORIZATIONS -- $134 MILLION IN FY 1983, $286 MILLION IN FY 84, $269 MILLION IN FY 1985, AND THEN DOWN TO $215 MILLION IN 1986, AND $193 MILLION IN 1987. THESE AUTHORIZATIONS TOTAL $1.097 BILLION. FOR THIS PERIOD, THE ADMINISTRATION REQUESTED APPROPRIATIONS TOTALING $1.074 BILLION, ONLY $23 LESS THAN AUTHORIZED. THE CONGRESS APPROPRIATED A TOTAL OF $46 MILLION LESS THAN WE REQUESTED.

WITH PHASE ONE OF THE NAS PLAN NOW MOVING TOWARD THE HARDWARE INSTALLATION PHASE, THE RELATED R&D EFFORT IS NEARING COMPLETION, ALLOWING US TO INCREASE THE EMPHASIS ON THE FAA'S SAFETY, ENVIRONMENTAL, AND OTHER AIR TRAFFIC RESEARCH AND DEVELOPMENT. OVERALL, AS YOU KNOW, THE FY 1987 RE&D LEVEL APPROPRIATED FOR THE

FAA BY CONGRESS IS $142 MILLION, AND THE ADMINISTRATION SEEKS AN INCREASE IN FY 1988 TO $150 MILLION.

THE ADMINISTRATION'S FY 1988 REQUEST SEEKS INCREASES IN SIX OF THE SEVEN MAJOR RE&D PROGRAM AREAS WHEN COMPARED WITH THE AVERAGE ANNUAL AMOUNTS COMMITTED TO EACH OVER THE LAST SIX YEARS.

SPECIFICALLY, THE SIX-YEAR AVERAGE FUNDING FOR FY 1982-1987 COMPARES WITH OUR FY 1988 REQUEST AS FOLLOWS:

- "AIR TRAFFIC CONTROL" UP FROM $62.7 TO $89 MILLION;
- "AVIATION SAFETY" UP FROM $16.5 TO $21.4 MILLION;
- "AVIATION MEDICINE" UP FROM $3.9 TO $4.3 MILLION;
- "AVIATION WEATHER" UP FROM $10 TO $18.3 MILLION;
- "NAVIGATION" UP FROM $6.1 TO $6.7 MILLION; AND
- "ENVIRONMENT" UP FROM $1.7 TO $2.2 MILLION.

THE ONLY PROGRAM AREA DECREASING IS THE ONE COVERING ADVANCED COMPUTER HARDWARE AND SOFTWARE TECHNOLOGY. IN FY 1988, ABOUT $7.7 MILLION WOULD BE SPENT FOR THAT PURPOSE UNDER OUR REQUEST, WHILE AN AVERAGE OF $78.6 MILLION HAS BEEN DEDICATED TO THIS AREA OVER THE PAST 6 YEARS. THE BULK OF THIS FUNDING WAS SPENT DURING THE DESIGN COMPETITION PHASES OF THE HOST COMPUTER AND THE ADVANCED AUTOMATION SYSTEMS, WHEN NEW COMPUTER CAPABILITIES HAD TO BE DEVELOPED IN ADVANCE OF ACTUAL PROCUREMENT AND PRODUCTION.

COMPARING FY 1987 ALONE TO THE FY 1988 ADMINISTRATION REQUEST, THE ADMINISTRATION SEEKS AN INCREASE OF ABOUT 6% IN FAA'S RE&D FUNDING. THIS GAIN FROM FY 1987 LEVELS IN TIMES OF OVERALL SERIOUS BUDGET CONSTRAINT DEMONSTRATES THE ADMINISTRATION'S UNDERSTANDING OF AND COMMITMENT TO AVIATION RESEARCH AND DEVELOPMENT.

WITH RESPECT TO THE CONCERN EXPRESSED IN YOUR LETTER ABOUT COMMITMENT TO FUTURE AIR TRAFFIC CONTROL NEEDS, I BELIEVE THE FY 1988 REQUESTED INCREASE FOR "AIR TRAFFIC CONTROL" R&D, WHICH WE WOULD EXPECT TO CONTINUE IN FY 1989, IS THE BEST EVIDENCE THAT OUR EMPHASIS ON THIS AREA WILL NOT FLAG AS THE NAS PLAN IS IMPLEMENTED.

I WOULD LIKE TO REVIEW FOR YOU JUST A FEW OF THE NON-NAS-PLAN R&D ACTIVITIES FAA PLANS TO UNDERTAKE TO ADDRESS IMPORTANT AVIATION ISSUES, SUCH AS ENHANCING THE CAPACITY OF THE NATION'S AVIATION SYSTEM. THIS IS ONE OF SECRETARY DOLE'S HIGH PRIORITIES. TOGETHER WITH THE AVIATION INDUSTRY, THE FAA HAS IDENTIFIED A NUMBER OF CONCEPTS THAT MAY INCREASE AIRPORT CAPACITY, IMPROVE SAFETY, AND REDUCE DELAYS. ONE PROJECT THE FAA CONSIDERS VERY PROMISING FOLLOWING STUDY IN FY 1987 -- INDEPENDENT APPROACHES TO DUAL RUNWAYS WITH 3,000 FOOT CENTERLINE SPACING -- WILL NOW PERMIT A LANDING MONITOR CONCEPT TO BE SELECTED AND DEVELOPMENT STARTED IN FY 1988 FOR THESE TYPES OF RUNWAYS. ALSO, THE NEW RE&D FUNDING WILL ALLOW THE FAA TO BEGIN DEFINING AND SELECTING OTHER PROMISING

CONCEPTS FOR INDEPENDENT INSTRUMENT FLIGHT RULE APPROACHES TO OTHER SITE-SPECIFIC RUNWAY CONFIGURATIONS.

THE FAA WILL ALSO CONTINUE TO ANALYZE AND VALIDATE THE CURRENT U.S. AND INTERNATIONAL AIRSPACE SEPARATION STANDARDS, IN RECOGNITION THAT THE CAPACITY OF THE ATC SYSTEM DEPENDS TO A LARGE EXTENT ON THE STANDARDS USED TO ENSURE SAFE SEPARATION OF AIR TRAFFIC. THIS IMPORTANT RESEARCH MAY LEAD TO NEW STANDARDS OF SEPARATION, BUT ALWAYS CONSISTENT WITH MAINTAINING THE HIGHEST LEVELS OF OPERATING SAFETY.

OTHER CAPACITY IMPROVEMENT INITIATIVES INCLUDE THE DEVELOPMENT OF A CONCEPT FOR AN ADVANCED TRAFFIC MANAGEMENT SYSTEM, TO ALLOCATE AS EFFICIENTLY AS POSSIBLE TRAFFIC DEMAND TO AVAILABLE SYSTEM CAPACITY. AN AUTOMATIC DEPENDENT SURVEILLANCE SYSTEM, FOR USE IN IMPROVING THE MONITORING AND CONTROL OF AIRCRAFT OVER OCEANIC AIRSPACE, IS ONE MORE PROMISING TECHNOLOGY THAT CAN RELIEVE CURRENT BURDENS ON OUR AIR TRAFFIC MANAGEMENT RESOURCES.

I WOULD STRESS ONE OTHER AREA OF FAA RESEARCH OF PARTICULAR IMPORTANCE TO THE SECRETARY'S EMPHASIS ON SAFETY. THIS RESEARCH WOULD ADDRESS THE PROBLEM OF RUNWAY INCURSION INCIDENTS. WE ARE DEVELOPING IMPROVED AUTOMATION TOOLS TO ALERT THE CONTROLLER OF POTENTIAL CONFLICTS ON AIRPORT SURFACES, AND WE ARE EXPLORING ENHANCEMENTS TO EXISTING AIRPORT SURFACE DETECTION RADAR TO PROVIDE AUTOMATIC RADAR TRACKING AND TARGET CLASSIFICATION.

NOW OUR REQUESTED INCREASES WILL BE SCRUTINIZED ANEW IN THE CONGRESSIONAL BUDGET AND APPROPRIATIONS PROCESS. I URGE THE AVIATION AND R&D LEADERSHIP IN CONGRESS TO DEFEND OUR REQUEST OF $150 MILLION, WHICH WILL BE IN THE BALANCE WITH ALL OTHER COMPETING NEEDS THROUGHOUT GOVERNMENT AS THIS YEAR'S BUDGET AND APPROPRIATIONS PROCESS PROCEEDS. THE HOUSE'S RECENT ADOPTION OF A BUDGET RESOLUTION "FREEZING" FAA AT FY 1987 LEVELS, WITH FURTHER POTENTIAL REDUCTIONS TO ABSORB AN UNDISTRIBUTED $800 MILLION REDUCTION IN TRANSPORTATION PROGRAMS, CLEARLY PUTS OUR RE&D REQUEST AT RISK, ALONG WITH THE OVERALL 20% REQUESTED INCREASE FOR THE FAA THAT WOULD PROVIDE, AMONG OTHER THINGS, MORE AIR-TRAFFIC-CONTROLLER AND SAFETY-INSPECTOR POSITIONS.

TURNING FOR A MOMENT TO OUR FY 1988 AND 89 NAS PLAN REQUEST, THE ADMINISTRATION PROPOSAL KEEPS THE NAS PLAN ON TARGET WITH AN INCREASE IN EXPENDITURES BETWEEN FY 1987 AND 1988 ALONE OF 68 PERCENT, TO $1.35 BILLION, AND A FURTHER INCREASE TO $1.5 BILLION IN FY 1989. TO DATE, NAS PLAN ACHIEVEMENTS HAVE BEEN SUBSTANTIAL. FOURTEEN PERCENT OF THE NAS PLAN PROJECTS ARE COMPLETE, AND OVER 75 PERCENT ARE UNDER CONTRACT. APPROXIMATELY 4,400 INDIVIDUAL EQUIPMENT COMPONENTS HAVE ALREADY BEEN DELIVERED TO THE FIELD. BY THE END OF FY 1987, 90 PERCENT OF THE NAS PLAN PROGRAM WILL BE UNDERWAY. WHILE MODERNIZING THE SYSTEM, WE WILL ALSO BE SPENDING MONEY ON MAINTAINING THE LARGE CAPITAL PLANT ALREADY IN PLACE.

IN SUM, I BELIEVE OUR FY 1988-89 REQUEST SEEKS ALL THAT WE CAN WISELY SPEND TO IMPLEMENT THE NAS PLAN DURING THOSE TWO YEARS.

HOWEVER, THE CONGRESS MUST FULLY FUND THESE REQUESTS IF DELAYS CAUSED BY FISCAL SHORTFALLS ARE TO BE AVOIDED. WE HAVE BEEN ABLE TO KEEP THE NAS PLAN ON COURSE DESPITE THE FACT THAT CONGRESS HAS APPROPRIATED $943 MILLION LESS THAN THE REAGAN ADMINISTRATION REQUESTED FOR THE NAS PLAN OVER THE LAST SIX YEARS. BUT THE COUNTRY CANNOT AFFORD ANOTHER YEAR OF DANGEROUSLY SHORT-SIGHTED POLICIES THAT SACRIFICE UPGRADING OF THE AIR TRAFFIC CONTROL SYSTEM TO OFFSET HUGE SUBSIDIES FOR NEW MASS TRANSIT SYSTEMS, REGARDLESS OF NEED, AND TO SUBSIDIZE MIDDLE-CLASS AS WELL AS WEALTHY AMTRAK PASSENGERS.

THIS COMPLETES MY PREPARED STATEMENT. JANET HALE, JON SEYMOUR, AND I WOULD BE PLEASED TO RESPOND TO ANY QUESTIONS YOU OR MEMBERS OF THE SUBCOMMITTEE MAY HAVE.

Mr. McCURDY. Thank you, Mr. Secretary; appreciate your statement and the directness in it. I appreciate your responding to some of the questions that I had outlined in the letter to you.

Even though some of these may be redundant, I think it is important that we go back through and hit some of these key points and have some elimination of them.

Specifically, the FAA's initial request to OST for RE&D for this year, FY 1988, was $207 million. OST and OMB cut this to $150 million, deleting producing or delaying many projects aimed at post-NAS Plan safety and productivity improvements, specific examples such as human factors research, airborne wind shear detection and improved sensors and procedures to enhance airport capacity.

Can you explain the rationale of OMB and OST for limiting RE&D mainly to support immediate NAS Plan needs?

Mr. BURNLEY. Yes, Mr. Chairman. I think it's terribly important to be as precise as possible about where we went in each of these items and also to make very clear that in fact, there was not a $57 million cut in the funding that we have requested from the Congress.

$29,589,000 of that $57 million was moved to the F&E account and it was simply a judgment that was made during the process of putting the budget together, that those particular requests were better suited, made more sense in the F&E account versus the RE&D account, and that's the kind of judgment we routinely make in each year on the budget, particularly with NAS Plan related expenditures, a period of time, as I said in my prepared statement, where there has been a large hump in the RE&D account, that we are now moving over much more toward the F&E side, as we reach implementation. The judgment was those fit on the implementation side to a greater extent than they did on the RE&D side.

Now, with respect to the balance, when you lay to one side the $29.5 million and the other things we addressed, judgments were made in the process that there were opportunities where perhaps by moving funding slightly forward, it would be possible to pick up sums in a variety of these accounts without affecting the research itself and without affecting the timing in any significant way.

I'd be happy, although I don't claim detailed knowledge dollar by dollar of how it was done, I would be happy to go through examples to the extent it would be useful and if the Committee wishes, we can certainly provide additional background on the entire list.

Mr. McCURDY. That would be fine. You can detail that and maybe supply that for the record.

[Information to be furnished follows:]

PREPARATION OF THE ADMINISTRATION'S FY 1988 RESEARCH, ENGINEERING, AND DEVELOPMENT BUDGET REQUEST - FAA

We were able to reduce our R&D program from $207 million to $150, while still providing full funding for all NAS plan related R&D and aviation security programs, through a series of management actions. As I just mentioned, we moved projects totaling almost $30 million from R&D to the F&E account. In addition, several projects encountered delays, which enabled us to defer associated R&D funding requirements to later years. The replanned Advanced Automation System acquisition strategy, for example, affected the schedules of several related R&D projects, as the Advanced Traffic Management System, Computer Aided Decisionmaking for Air Traffic Control, and User Preferred Routes. We also found that much of the controller human factors work was being performed as part of the Advanced Automation System work, making it possible to defer activities related to the later phases of ATC automation. Further analysis also indicated that some projects, like the Voice Automated Cockpit project and Global Positioning System enhancements, depended on new technology that needed to be demonstrated through other existing R&D projects before undertaking the next funding increments. The decision to transfer development of the Automated Weather Observing System to the National Weather Service also resulted in termination of some of the activities associated with the development of improved weather sensors. Finally, we examined all projects to establish revised schedules based on current program content. As a result, we were able to stretch out some developmental phases with virtually no effect on the projects. Examples include research in the rotocraft support area, automatic dependent surveillance, and some sustaining engineering efforts.

Mr. BURNLEY. Just as a "for instance" of the kind of process that we went through, we cut $600,000 on flight service station enhancement R&D that was looking to a period post-NAS Plan. You are talking about the mid to late 1990's, and among the judgments made there was that we have to go ahead and finish the automation consolidation process and put the NAS Plan in place, to really know where we are going. It was that kind of a series of judgments.

Mr. MCCURDY. For the 5 years, 1983 through 1987, the cumulative Administration request for RE&D and F&E have been under the corresponding authorization, and I noticed in your prepared statement, you emphasized appropriated levels, which is there is a clear distinction here between authorization levels and appropriation levels, and that was different by $22 million and $768 million respectively, whereas appropriations have actually been under the request by $47 million and $863 million in each of those categories.

These shortfalls are one reason for delays in the NAS Plan, in the large trust fund balance. From your perspective, why did this happen? Why did it occur? What can be done to prevent a continuation of these discrepancies?

Mr. BURNLEY. If I may, Mr. Chairman, let me politely disagree that we have had significant delays in the NAS Plan thus far as a result of that shortfall. There has been a shortfall. Again, as I noted in my prepared testimony, by our account on just the F&E part of the budget alone, the Congress has appropriated some $943 million less than we have asked for during this reauthorization period, back to the 1982 Act.

My judgment is that we are seeing, despite the fact that we have a dedicated trust fund, we are seeing in the appropriations process tradeoffs being made, where non-aviation programs that a majority of the members of the relevant Appropriations subcommittees, committees and ultimately the two Houses, feel are worthy of funding, are given priority over our request for full funding of our needs on the NAS Plan.

Again, as I said at the beginning, that can't go on any more. We have been able, we think, to keep the NAS Plan pretty much on course, despite the fact that we have had these shortfalls in appropriations, by moving obligations from September to October, forwards, so the funding moves over to the next fiscal year.

You can only do that for so long before it catches up with you and it has caught up with us. We have also survived to date without again funding being a major source of delays because frankly, no surprise here, we had along the way in a number of these major projects, problems develop on the technical side and particularly when you are talking about software, we have seen some delays, that meant that for technical reasons, we were getting behind schedule. The funding was not in and of itself the problem.

Again, we have gotten to the point we believe where we really must see funding over the next couple of fiscal years at the levels we have requested or funding will be a major source of delays in the NAS Plan, and that will have an impact on capacity. It will have an impact on delays and conceivably can have an impact on safety.

Mr. MCCURDY. The House budget resolution was termed the perfect compromise, and I don't know if anyone really liked it, every-

one seemed to dislike the resolution, because it definitely had an impact on every area across the spectrum.

In the areas I deal the most in, functions 050 and 250, the space program, science and research and also in defense, were severely cut, and that's been a concern to us.

In your statement, you indicate that if the House budget resolution levels, freezing at 1987 levels, were adhered to or emerges from Conference, that they will have severe impact on the NAS Plan. Could you give us any indications of where you see or some specifics of where this would impact, the difference between the $138 and the $150 million?

Mr. BURNLEY. Let me give you a "for instance", if I may. We are pushing ahead at the maximum possible speed in terms of the technical development on both what we call terminal NEXRAD and also terminal Doppler radar. As you know, both of these systems are designed to address in part the problem of wind shears.

I would have to go back and look at the numbers. Perhaps Mr. Pozesky can fill us in without my even doing that. That's a "for instance" of the sort of projects we will have to go look at and we will have to make judgments about whether we slow down that work to put the money over to keep the AAS system moving or rather we slow down AAS on the other hand, so the money can go into those sorts of projects.

I've just been handed a note that says on the NEXRAD and terminal Doppler systems, $130 million of our F&E and RE&D request for next year is for those projects, and we will have to sit down and at best look at whether we cut back. I would hope that we would never zero out on something like that. That's what is at risk. Again, to date, we have managed to stay pretty much even with the pace of the technology and the development and the actual procurement process but we just don't see how we can go another year without having full funding on these requests.

Mr. MCCURDY. Very good. I yield to the gentleman from Florida, Mr. Nelson.

Mr. NELSON. I appreciate it, Mr. Chairman. Thank you. I have to go and I wanted to take this opportunity to just ask one question, if I may, and say hello to Mr. Burnley, who I have had the privilege of working with on the Space Subcommittee. It's good to see you.

Mr. BURNLEY. Good to see you.

Mr. NELSON. My question gets into the allocation of frequencies to Argentina. You have this coming up in some capacity decision that you are going to make on May 1st. It is my understanding that Pan Am and Eastern have requested a substantive hearing on this question of Argentina capacity allocation. I want to know if you are going to grant that request to develop an analysis and substantive hearings record to support whatever is going to be your May 1st decision?

Mr. BURNLEY. Congressman, to be perfectly candid with you, I have some familiarity with that issue and sitting here at this moment, I don't know the answer to your question. Let me get it for you and call you if I may immediately and we will also put it in the record.

[Information to be furnished follows:]

ALLOCATION OF AVIATION FREQUENCIES—ARGENTINA

With regard to the Argentina aviation frequencies issues pending before the Department of Transportation prior to May 1, 1987, informal agreement of the air carriers involved resulted in postponing determination of the issues until mid-June 1987.

Mr. BURNLEY. Let me say this; the whole process of frequency allocation in a situation such as that that we have with Argentina has been the subject of a good deal of senior level discussion in the Department in recent days, because we find ourselves in a situation where we are asked to make judgments and you have two respective carriers and they can both make very plausible cases about who ought to get how many frequencies and both of them can make persuasive cases about the adverse impact it will have if they don't get what they want.

The bottom line is the process by which those judgments are being made is perhaps misleading in the sense that we try to make it look like and we try to be as rational as we can and make it on the merits. When you get right down to it, it's very difficult to make those judgments. I mean, you have two very plausible cases and it's literally right at the point of do you flip a coin in the sense—or some other arbitrary device in deciding between them.

There's no real basis when you have two carriers like those two in particular, to make that judgment strictly on the merits. They each have good stories to tell, in other words.

Let me get an answer for you about the request on a hearing. I will say this further; certainly, to the extent that we can give carriers the chance to come in, create a public record and make sure we know everything they want us to know, it helps, and it does give us at least a fighting chance to make a rational, on-the-merits judgment as compared to simply creating the appearance of making one.

Mr. NELSON. Other than that, do you just flip a coin?

Mr. BURNLEY. No, sir. We have not gotten to that point but we had in this very instance, a reduction in the allocations. We thought we had an agreement and it turned out Argentina and we had a different view of that. We did have recently, and I think I have my Latin American country correct, I'm quite certain it was Argentina, we did have to make a judgment where there wasn't any rational basis to make it. I mean, there were literally 50 pounds of good arguments here and 50 pounds of good arguments there.

In that instance, somewhat to the dismay, I might add, to some of the long time folks dealing with these issues, yes, we used an arbitrary, pull it out of the hat process and told the carriers we were doing that. We didn't do it secretly. There was literally no basis. If we had said, we are doing this on the merits, you guys have a better case than those guys, we would have been fooling them. It just wasn't there.

Mr. NELSON. Soon you are going to make this decision because it's my understanding the Secretary of State is getting ready to finalize this bilateral agreement with Argentina.

Mr. BURNLEY. Let me get back with you, if I may.

Mr. NELSON. Okay. Answer for the record. Thank you and I thank Mr. Lewis for the opportunity to inject here.

Mr. MCCURDY. We thank the gentleman from Florida, who is certainly a valuable member and we appreciate his interest in the subject.

Mr. Burnley, one of the reasons this authorizing Committee and Subcommittee have been able to authorize at a level higher than the President's request is because of our concern for the system but also the fact that we have a very good working relationship, this Chairman and the ranking member from Florida, Mr. Lewis, and I think we share a concern for air safety, for the research and development. I think we are both frustrated sometimes when the Appropriations Committee doesn't follow some of the guidelines that this Committee has sent forward. We do have a very good working relationship and I certainly like to state as often as I can publicly my appreciation to Mr. Lewis for the work he does and the ability to work together as well as we do.

With that, I am going to turn it over to Mr. Lewis, and yield to him for any questions at this point.

Mr. LEWIS. Thank you, Mr. Chairman. I apologize for being late, and also to you, Secretary Burnley. I would like to insert my opening statement into the record, if I may.

Mr. MCCURDY. Without objection.

[The prepared statement of The Honorable Tom Lewis follows:]

OPENING STATEMENT
HONORABLE TOM LEWIS (R-FL)
T&M SUBCOMMITTEE HEARING ON FAA AUTHORIZATION
APRIL 23, 1987

THANK YOU, MR. CHAIRMAN.

ONE OF THE LARGEST CIVILIAN GOVERNMENT PROJECTS EVER UNDERTAKEN IS THE NATIONAL AEROSPACE SYSTEM PLAN. THIS $12 BILLION MODERNIZATION PLAN CALLS FOR THE USE OF THE LATEST STATE-OF-THE-ART AIR TRAFFIC CONTROL COMPUTERS, EXTENSIVE AUTOMATION OF AIR TRAFFIC CONTROL AND MANY OTHER PROJECTS.

AGENCY WITNESSES TESTIFIED THAT THE NAS PLAN IS BEHIND SCHEDULE AND INCREASING IN COST. ASSOCIATION WITNESSES AT THE MARCH 24 HEARING SAID THAT THE RESEARCH EFFORTS TO SUPPORT THE PLAN ARE INADEQUATE. OTHERS POINTED OUT THAT FAA'S NON-NAS PLAN RESEARCH IS ALSO UNDERFUNDED.

ON THE OTHER HAND, THE FAA ADMINISTRATORS TESTIFIED THAT THE FY 1988 BUDGET REQUEST IS ADEQUATE TO MEET THE RESEARCH NEEDS OF THE AGENCY.

MY INTERESTS ARE IN SEEING THAT THE U.S. AIR TRAVEL SAFETY RECORD CONTINUES AND THAT THE FAA'S RESEARCH PROGRAM IS ADEQUATE TO SUPPORT THE U.S. AIR SAFETY REQUIREMENTS, INCLUDING THE NAS PLAN.

I AM ALSO CONCERNED ABOUT THE CONTINUITY OF THE FAA PROGRAMS OVER THE NEXT 20 MONTHS. WILL THE NEW FAA ADMINISTRATOR, WHO REPLACES THE RETIRING MR. ENGEN, CONTINUE THE STRONG RESEARCH EFFORTS OR WILL A CARETAKER BE APPOINTED WHO WILL NOT BE A STRONG FAA SUPPORTER?

I WANT TO WELCOME OUR WITNESS, MR. BURNLEY. I AM PLEASED THAT WE WERE ABLE TO WORK OUT THE SCHEDULING PROBLEMS SO YOU COULD BE WITH US TODAY.

THANK YOU, MR. CHAIRMAN.

Mr. LEWIS. I would like to discuss a few things. In the Post, and you probably saw this article this morning, in the Washington Post about errors and the correct use of computers and warning devices by pilots and air traffic controllers alike, depending on how the information is really presented, if there is too much information, the pilot may concentrate on the screen and not look outside, thereby increasing the possibility of an accident.

Another example is pointed out in the article this morning that Mr. Engen has appointed a task force to look into these factors that lead to controller errors. This action was based, I guess, on an FAA survey and about 1,400 controller errors were found and 26 percent of these were by misreading the radar.

Does the DOT support human factors research at FAA, that would determine the best way to display this information and avoid errors and ways of preventing controller errors? How gung ho are you in this particular area?

Mr. BURNLEY. Congressman, we are very "gung ho". The work to be done in that area is enormous on the one hand, the work before us, and on the other hand, a great deal has been done, and let me take that a little further, if I might.

We, as you I'm sure are aware, have among the NAS Plan projects, a number of communications projects that are designed to do all that we can to improve the information flow between a controller and the pilots. The Mode S system, of course, is a central part of that, which will include not only data that will move by non-voice means, about positioning issues, that sort of thing, but also weather data as well.

We also have underway the development phase of our contract on the voice switching and control system, which will be a system-wide change and hopefully dramatic improvement.

Additionally, in the advanced automation system with the sector suite, you are talking about, as you know, completely redesigning and reconfiguring where the controller sits, what the display looks like, going to color, from the green on green displays we have today, and basically revolutionizing the inside of a tower or what an en route center will look like several years from now.

We have a great deal going on in that area already. The judgments we have to make in this context, when we come back to RE&D requests this year or next year, what have you, is how much money do we spend and what projects do we spend it on, to build upon the work that is already being done.

Just before you arrived, I had said in response to a question from the Chairman that in looking at whether there were opportunities to shave $200,000 here or $400,000 there from some of the specific projects, our folks and the FAA folks had looked at the point at which we will be best able to utilize additional research.

Human factors is a "for instance". There is a pretty good argument to be made, I think, that we need to both keep that research underway but also we need to get further along with the development, design and then procurement of major NAS Plan systems, many of which I have just alluded to, so then your future human factors research is going to be based upon all this new stuff you put in. We really have a great deal of change underway, it's very rapid change and it's all going to happen in the next few years.

I think once it's all in place, there will then be an opportunity for the Congress as well as the Department and the FAA to look at how it's working and we will then perhaps want to reach a whole new phase of human factors research based upon all the new hardware and software that is in place.

I'm not saying we ought to do nothing until then, quite the contrary. I'm saying that we have so much underway in that area already, it is going to have a profound impact on communications between pilots and controllers, that we really need to be cognizant of the fact that we can go off and spend money and do projects in this area today that will be irrelevant in the sense that things will change by the time we get the results of that R&D.

I might comment further on that story this morning. Admiral Engen, as the story says, has appointed a task force to look at controller errors. We are all befuddled by the fact that we have seen a blip, and a blip that we are not at all happy about in the first quarter of this year in errors, and we wouldn't like it under any circumstances, but we are particularly dissatisfied because we had a 25 percent decline in errors in 1985 compared to 1984 and then in 1986, it went down another 13 percent. The trend has been dramatically toward a decline in errors and suddenly, we have a quarter where it blips up. It could just be we had a bad quarter. We don't know.

The other thing that makes the importance of this task force clear is that in looking and analyzing the increased error rate, the FAA has discovered that they are finding controllers who have just come on the job and who are handling less than 10 planes, showing a disproportionate increase in the error rate. In other words, just the opposite of the situation you would think might cause an increase in errors, where you have somebody who has been working a full shift and is tired and is handling lots of traffic. Those are not the places where we are seeing the disproportionate increases.

We are very, very interested in what this task force can do for us and certainly very concerned. The problem is going to get addressed in whatever way we can.

Mr. LEWIS. Do you think your budget of $1.6 million is adequate, the request is adequate for human factors research, in view of the fact that you have an unexplainable blip of a 26 percent increase?

Mr. BURNLEY. Well, let me say this, Congressman. I don't think—the short answer is I don't think the two are related, in this instance. We have had a blip. It is on top of two years of dramatic declines, and as far as I'm aware, none of the projects that were in the FY 1988 request were going to yield or were designed to yield overnight results that would address this first quarter problem.

Again, no question, in the long term, this research in human factors is terribly important. I know when Admiral Engen appeared here a month ago, he testified about the importance he attaches to it, and I agree with his assessment. I read the transcript of the hearing and would fully endorse what he had to say about it.

The judgment that has to be made is whether $1.6 million fully satisfies what we think we can profitably spend funds on in the RE&D area and I would ask you to make that judgment in looking at our judgment and doing very appropriate second guessing of us on that, by looking at all the factors I just discussed about the very

rapid rate of change that is going on, and what the controller is going to have in the way of information systems and displays and what the pilot is going to have in the way of information systems and displays.

It's in that light. Now, in a perfect world where you had no budgeting process and no appropriations process, could we find additional projects and could the FAA identify additional projects that might be interesting and/or ultimately useful to spend additional sums, I'm sure the answer is yes.

Is there a critical problem being created by the fact that we are at $1.6 versus $2 million? No, sir. I do not believe there is any evidence of that, given the context.

Mr. LEWIS. I just want to be satisfied we are not looking at frugality and sacrificing safety and the ability to improve our safety records.

Mr. BURNLEY. I share your desire and Secretary Dole very emphatically shares it also, that we not do that. That has a good deal to do with why we are before the Congress with a request for a 20 percent increase in FAA funding overall. We have got more inspectors than we ever had in the history of the FAA and we are asking for more, another 178. We are going to be at 15,000 controllers. We added 1,000 last fiscal year. This fiscal year, by September 30, we are going to be at 70 percent of the eligible controllers being full performance level controllers and we are going to ask for another—we have asked for another 225 more for FY 1988.

Those are "for instances" of what is in that 20 percent increase in addition to the 6 percent increase overall in RE&D that we are seeking.

Mr. LEWIS. I don't know if you can answer this or not, but there has been some concern due to Admiral Engen's background and experience, he's an advocate of research and continued to move ahead with a strong research program for the FAA. There is concern now that his replacement could very well just want to be a caretaker and sort of slight the R&D programs that the Admiral has been moving along quite rapidly.

What's your general feeling on that?

Mr. BURNLEY. Congressman, I risk treading in areas where mere mortals like myself don't belong, and that's on the prerogatives of the President and the U.S. Senate in confirming the President's nominee for that job.

I think, however, getting right up to the edge of the area I don't belong in, that it's very likely that process will yield a new Administrator who fully shares the Admiral's views in this area and attaches the same degree of importance to it.

Mr. LEWIS. I certainly hope so, because it took a while to get off the dime and we have really been heading down the pike in the direction we should, even though sometimes I feel that certain areas are moving too slow, I think the Admiral has done an excellent job and I certainly would hate to see that go.

Would that come, as the policy making body, would that be under DOT to police this area?

Mr. BURNLEY. Yes, sir. Again, if I may, we are not in the habit of calling over to the FAA Building and saying, it's time to spend an extra $800,000 on this or that, and the way the process works, the

FAA comes to the Department and we go hand and hand with them to OMB and then to the Congress.

On the other hand, there are areas, and aviation security is a good example, where the Secretary and the Administrator have in the last couple of years haddiscussions and agreed we needed to spend more money on explosion detections, that kind of thing.

We will certainly continue to see those lists that the FAA prepares and we will have continuing discussions just like we have now with them about what they think they are going to do. There is an oversight responsibility there and it's a responsibility we take seriously.

Mr. LEWIS. I'd like, if I could, just touch on the airport and airway trust fund. I'm sure you are probably tired of hearing about it by now.

Mr. BURNLEY. It's a terribly important issue.

Mr. LEWIS. Nonetheless, it's very important to me because we are charging the passengers a percentage of their ticket in order to really work to upgrade the safety features of the various airports throughout the country. It seems to be extremely slow in allocating this money. Right now we have about a balance of $9 billion, I guess, in this trust fund. I know these numbers change on occasion. There is $4 billion unallocated. I know the FAA at one time wanted to use some of this money for operating funds, which I am opposed to. I feel that the money should be used for what it was actually designed to do. There are a number of airports in this country that certainly could make use of some of that $4 billion in order to upgrade the safety factors of those airports.

Is there going to be a new vision in DOT as far as establishing a policy for the use of this money or are we going to have to push through the bill to cut off collection of the funds as the bill now states and the balance drops below $1 billion, we go back into it?

I would hate to see that happen. I certainly feel we have done a terrible job in allocating these funds over the past years for the purpose intended.

What is the policy going to be at DOT?

Mr. BURNLEY. Well, Congressman, if you will bear with me a little bit, I will touch upon several of the points that you have touched upon in answering the question.

To begin with, I think it useful to review what the Congress did in '82, and when it reauthorized the Trust Fund. It made a judgment at that time that the Administration ended up being comfortable with, in the sense the President signed the legislation, that 71 percent of the cost of the FAA, including the AIP program, the NAS plan, and the R&D account, as well as operations, 71 percent of all those programs should be funded out of the Trust Fund. We had sought 85 percent.

As you know, the Congress also included a trigger device designed to reduce the funding out of the Trust Fund for operations if certain targets weren't met as set by that legislation in the other accounts.

As a result of that triggering device, what's happened is, despite the Congress having made the judgment 71 percent was the percentage they wanted to achieve overall, only 57 percent of the FAA's overall cost during the period since '82 have been covered

out of the Trust Fund. That is a very substantial reason why we have, by our calculation, as of the end of this fiscal year unobligated balance in the Trust Fund of $5.6 billion.

In fact, using that 85 percent figure, which today, by our count, may slightly understate the percentage of the costs being generated by the nongovernmental users of the system, in fact, the general fund has been called upon to cover $7.5 billion of the FAA's overall cost since '82, as against a balance it's built up of $5.6 billion that's unobligated.

Now, I don't come to you today, and we haven't in our reauthorization proposal sought to recoup for that period. I think it important, though, to give you our perspective on what's happened since '82 and what the Congress told us its goal was, that 71 percent figure.

We have come back looking for 85 percent coverage, and under our proposal, on the other hand, we would in '88 and '89 see the Trust Fund's unobligated balance reduced from $5.6 to $4.3 billion. In other words, we would start it on the path downward, and that's for that 20 percent increase we're seeking in the first of those two years, and a little more than that in the second year.

Now let me make this point, if I may. Whether you agree or disagree with the Administration's analysis—and particularly you've noted your disagreement on the operations side—nonetheless, I think it is clearly the case it strengthens our hand in going to OMB and going to the Appropriations Committees after OMB, to the extent that we are in a position to say we are trying to use the Trust Fund to cover the costs that we incur in the Department at the FAA because of the users of the system out there, and I think what's happening to us is we're given a situation where we've got two legitimate but opposing views about how the Trust Fund should be used, whether operations should be substantially funded out of it or not, and the frustration level's built, the appearance of these balances has built, whether you buy my argument or not about the $7.5 billion versus the $5.6 billion, and we are now hearing talk about the possibility of a provision in the reauthorization legislation that would reduce the revenues coming into the Trust Fund if they are not being spent at certain levels.

I would urge you, even if you remain frustrated with the direction in which this plays out, I would urge you not to support such a proposal, and the reason is that we could easily find ourselves in a situation where, with advanced automation, as a "for instance", since January 1st, we have under the coaxing—that's a polite way to put it—of the Appropriations subcommittees and the GAO—agreed to changes in the advanced automation system procurement that by our calculation are going to delay that procurement by 21 months, plus another six to eight months on top of that, in the 27 to 29-month area.

We are still going to need the money. What's going to happen is we are not going to spend it as soon. If you have a provision that cuts off the revenue flow, you run the risk that because of that kind of a dynamic, because we run into software problems we didn't anticipate on that or any other of these numerous projects, we end up not being able to reasonably obligate the money as soon as we'd like to and as soon as you want us to. We are still going to

need it; we are going to need every dime of it. And we just don't want to get in a situation where the Trust Fund balances are being drawn done despite the needs, and I agree with you, it ought to be spent, and the point, I think, where the Administration and you may disagree is, out of what account. And I think that there's just—there's got to be a better way to work this issue out, because that revenue stream is terribly important to be able to do all the things, both in the AIP program and on the capital side that we need to do.

Mr. LEWIS. That's a pretty good explanation. That's the first time I've heard someone give one like that. I appreciate that very much.

Mr. Chairman, I don't think I have any further questions at this time. I would like to say, though, I certainly appreciate the fact you allowed me 25 minutes.

Mr. MCCURDY. You're most welcome. You speak for me on those issues. I think we agree totally on some of our concerns about the Trust Fund. And it is a rather troublesome issue because not only for members of Congress, but a lay person sitting out there can't understand why these fees are being collected and all this money sits there, and I would disagree on one—or take issue with one term that you used. You indicated that Congress set a goal of 71 percent. My interpretation would be that that would be a ceiling of 71 percent, and that the—one of my former senators from Oklahoma, Mike Monrony, who probably had more to do with this, setting up this system than any person, was afraid that the camel would get its nose under the tent if we allowed for the Trust Fund to be used for operations, and that's why these triggers were placed in there, but as one of my staff assistants indicated, it didn't work, and the camel is already under the tent, and we are losing ground. And that's frustrating for us, and I know Tom and I agree that we don't like to see it—we'd like to see it used for other purposes, and I think the treasury has in effect backfired, and maybe we need to relook at that. I think the Administration ought to take a serious look at it, too, in their recommendations in the future.

But also, what are your views regarding the proposal to remove the Trust Fund from the unified budget?

Mr. BURNLEY. Well, Mr. Chairman, it will probably come as absolutely no surprise to the subcommittee that I don't think that's a very good idea.

Mr. MCCURDY. I thought we'd ask. Never hurts to try.

Mr. BURNLEY. For the record, let me take a moment more—I'll try not to be as long-winded with this answer as I was. I must say I appreciate him letting you have 25 minutes——

Mr. MCCURDY. You can take all the time you need.

Mr. BURNLEY. The problem that I see with that is that it doesn't address the issue that you want to address and that we want to address, and that's to see that the needs of aviation in this country are met.

Now you can take it off budget, but nonetheless, out there in the real world, where federal expenditures and federal revenues do net out, it's going to still net out, and you can say don't count it any more, but it is going to have an impact, for better or worse.

You can take it off budget and you still haven't addressed, in my judgment, the question of how much money ought to be spent. I

mean that's the question, is how much money ought to be spent. And when you take it off budget, it seems to me, what you're doing—and I don't mean this subcommittee, but I mean what the United States government is doing, is saying when all is said and done, we really can't just quite make certain very difficult decisions that we ought to be making. And when it comes right down to it, we don't want to be asked whether it makes more sense to spend the money out of the Trust Fund on aviation projects that we all agree are needed, versus spending about 30 bucks in subsidies every time somebody buys an Amtrak ticket. We don't want to have to make the decision between building a new billion dollar mass transit system in Los Angeles, versus how much we spend on the NAS plan.

And it is my humble opinion that that's what we're all here to do, is make those judgments, and those are judgments that should be made, and I would hope that I could persuade both of you gentlemen that there are judgments that we want to be on the same side as you want to be on. It's just a question of how you get there, and the better way to get there is to keep working on the folks who seem at appropriations time to have a real difficult time funding our needs in aviation, to the extent we all———

Mr. MCCURDY. We may agree on the goal. I'm not sure we're agreeing on the means or the—how you reach the goal. And that is—I mean I have no problem with subsidies for Amtrak. I voted against Amtrak, so I don't—I've got my own problems in that one, but the question of whether you're making these compromises or tradeoffs is if it weren't on the—or if it were not included in the unified budget, it would be a separated thing, you wouldn't be making a direct one-to-one trade. I mean you'd have appropriated monies out there, but the appropriated monies would be from the budget, and that ceiling would be applied to it as opposed to having this nice balance out there which helps on the overall deficit figure, but it doesn't do anything for the actual expenditure of those funds, when they're balancing that off for some other sacred project, whether it's an Amtrak in the Northeast or mass transit facility in L.A. or wherever it might be.

I mean the money in the Trust Fund is for air safety and those four categories under there, and not for these other projects. And so if that's the case, you ought to spend it and not count that against something else.

Of course, in—you know, there's a real danger of precedent here. What about Social Security, and what about the Highway Trust Fund, and what about—but the fact of the matter is that that is a designated fee for a designated purpose. And we have not been living up to the designated purpose. We are good at collecting fees, but we are not very good about expending it at the appropriate time.

Mr. BURNLEY. If I could just comment on one further aspect of this. That argument I respect as salient. I can't help but observe it might be stronger if we had your support on operations coming out of the Trust Fund.

Mr. MCCURDY. Do I see some forms in the fog out there———

Mr. BURNLEY. Because you end up saying "we want to use aviation trust funds to meet these aviation needs and collecting the

money and we ought to be spending it, except for the operations that we want to have funded substantially out of the general revenues." So it's not that they're inconsistent, it's just that they don't reinforce one another, perhaps, as arguments, and I do think that the underlying question of—is much bigger and more important than whether we're on budget or off budget, and that is we're collecting these revenues, and to what extent are they going to be applied to the aviation needs of this country and how are we going to do it.

Mr. McCURDY. I think that the latent fear that I'm sure that Mike Monroney had back in those days when the budgets were—probably the entire federal budget was less than Function 250 or certainly Function 050—was that the fear of building up bureacracies and just, you know, the operational ends just growing forever. And that's a real—I think that was probably an appropriate view considering the size of the federal government today, and that's a difficult tradeoff.

Tell me, switching topics here, tell me why the Administration supports—and this is again for the record, because I think we have an agreement here, but tell us why the Administration proposes a two-year bill as opposed to the five-year.

Mr. BURNLEY. Well, Mr. Chairman, I don't know of industry in this country that is changing as rapidly as aviation is today, and I mean both on the commercial side where the rate of change is particularly intense, but also with respect to general aviation, there are a lot of changes underway as well.

It is our judgment that we are in a particularly difficult period for any of us to predict with a high degree of confidence where we want to go and how we want to get there four or five years out. It's not that you can't ever do that again, but certainly we were much more comfortable, when all was said and done, with a two-year authorization period that would permit both the Administration and the Congress and the country to reassess where we are and where we want to go next in the spring of 1989.

Additionally, although the Administration did not push for this particular action, the Congress has mandated that a commission be appointed, and the White House has announced the names of, I think, six of the seven members the President intends to nominate for that commission, to study virtually all aspects of the FAA and its operations, and aviation in this country generally, and that report is to be in two stages. The second stage is to be completed under that statute 18 months from, I think, last November. So that by looking at a two-year reauthorization cycle as we make those judgments in the spring of 1989, we all hope we will have that report and the benefit of that commission's work, and a lot of other data and information.

And the bottom line is that we are just very hesitant, given the rate of change in aviation today, to say that we are comfortable and confident about our ability to predict where you want to be four or five years hence.

Mr. McCURDY. There's a perception among industry, and certainly when we had the session with a number of the users here earlier, that the Secretary's office is a bottleneck with regard to major

decisions such as FAA procurements. Would you care to comment on rebut?

Mr. BURNLEY. Well, sir, I've heard it rumored that that perception is out there. [Laughter.]

And I just can't resist—and, you know, it's such a rare opportunity where an Administration witness can come and quote the GAO to support a particular point, but it is true that the Office of the Secretary has very substantial involvement in the NAS plan, procurement process, as to the larger and more complex projects, and has certainly been very deeply involved in putting together the reauthorization proposal. And it is also true—and Mr. Seymour and I, as a matter of fact, had occasion this morning to talk about a "for instance"—that sometimes we are not the perfect engine of efficiency that we aspire to be. And I'm sure that Admiral Engen would certainly concede that there have been occasions he and I have chatted about, where OST didn't move quite as quickly as we both wanted. There have been other occasions where the FAA didn't get it to us quite as quickly as we both want it.

But the underlying question is what should that relationship be, and how far into basic and important decisions on aviation issues should the Office of the Secretary go? And as I said, I couldn't resist the temptation.

With respect to the NAS plan, we have just gotten in the last month GAO's latest insights on aviation acquisition in a report entitled "Improved Process Needs To Be Followed," and there are just a couple of passages that I want to particularly call the subcommittee's attention to.

On page 23—and again this is a historical document. I mean this portion of it, I think, is a document on its face says it is what they found had been happening, not what's happening today. For the projects reviewed, we found that FAA had frequently submitted them to DOT for approval, to advance in the acquisition process, with unreliable project cost schedule and performance estimates.

Additionally, FAA submitted projects without the required documentation, causing delays in project changes. Our analysis of the NAS plan major system project shows that all of the projects have experienced delays and/or cost increases.

Now that would be grossly unfair to the FAA to leave that statement standing in isolation, and at the end of the report, on page 34, under conclusions and recommendations, the GAO says:

> DOT and FAA have recognized weaknesses in FAA's major system acquisition process, and have taken steps to improve that process. They have revised their acquisition directives to incorporate improved management policies and procedures, and to conform them with the requirements and principles of OBM Circular A109. In addition, FAA has taken a number of actions to create better internal management controls over the total acquisition process.

Now, Mr. Chairman, the thrust of this report is that the Office of Secretary has been somewhat derelict in not being more aggressive in its oversight of major procurements in the NAS plan, and that under the OMB Circular A-109, there are four key decision points, and they criticize us because on the 11 major projects that they defined as the 11 major projects, in every single one of them, we let the FAA waive one and, in most cases, two of those four steps. So the GAO has said you guys have got to pay more attention, you got

to get in there earlier, you got to exercise more aggressive oversight.

The other recent GAO document I can't resist waving at you for a moment is a study that's just come off the presses of the overall management of the department, and I will say here today in public, as I have said to the GAO, and as this report reflects I have said, and as Elizabeth Dole has said, that we are frankly—and again, this is almost unprecedented to say this—pleased to have this document. It's a very constructive document. There are a lot of things here that we think are sound, and we intend to use this very substantially in our internal planning.

But looking at what they had to say about major procurements on page 51, they say "DOT Secretary and her top managers have recognized that problems exist and have initiated actions to make the three systems—this is financial information and procurement systems and integrity systems—more supportive and responsive to the needs of the Congress, departmental management at all levels and other users." And then they say some examples include, and one of the examples is procurement initiatives to review large procurements prior to solicitation, conduct systematic evaluations of the department's procurement offices, and develop a procurement career management program.

In other words, we're getting points because we've been doing those things.

So I think the answer to the question is, no processes are perfect, and I've found, since I came to Washington in 1981, that as I suspected, being a Republican from North Carolina, no governmental processes are always perfect. Although I have also found, I will quickly add, that they are a lot better than I probably thought they were before I came up here.

And we will continue to look for ways in which we can streamline the process. It's important, I think, to note that at the very beginning of the NAS plan, before I was at the department certainly, and when Lynn Helms was the administrator, and Drew Lewis was Secretary, at that time the Office of the Secretary changed the thresholds at which projects have to go through this thorough review, and if I recall correctly, Jon, it was raised from $20 million to $50 million as a threshold, thinking very explicitly about the NAS plan. It was a major NAS plan project. So that we have got a list of 10 or 12 NAS plan projects that, but for that change, would have gone through the OST review process, and which simply have not been coming over—at least not coming over for the detailed sign-off that they would have otherwise had.

I really think, Mr. Chairman, that when all is said and done, that certainly the current leadership of the FAA, and most particularly Mr. Pozesky, are doing a heck of a good job in trying to streamline their processes without, at the same time, sacrificing the need to do a lot of design work and a lot of R&D before you go buy things.

And we are trying, as best we can, to do what we can to expedite our review processes. And as the GAO has noted, to the extent that we are both making progress in making sure that the package that comes from the FAA to OST for review is complete and addresses

all the relevant questions, it makes life a whole lot easier for the folks in OST, and it makes it go much more smoothly.

Mr. McCURDY. Well, I appreciate that. And certainly those reports are important. I would only observe that, since I'm a member of the Armed Services Committee, I watch the offices over there in OST, and there's a difference between—if you agree with them, you call it oversight; but if you disagree, you call it micromanagement, and there's a delicate balance between the two. And you have to—I think what the concern is, is not that you're involved in the process. It's that perhaps there's a bottleneck created, and that it's important where there are procedural problems to change the procedures; where there are personnel problems, to change the personnel; and what you tried to accomplish is a smoother operation in the decision-making process. And if the two are not in sync, then you have problems. I assume that's what you mean.

The—we also understand that FAA has a number of high level management vacancies.

What are your plans for filling those vacancies? Was there a need to change some of the procedures in order to accomplish this?

Mr. BURNLEY. Mr. Chairman, I want to address both the macro and then the micro picture on that. The FAA has at the SES level, I think, 144 authorized positions, and at the moment, 138 of those have got warm bodies in them. On the other hand, we are listing 12 positions as vacant, which adds up to 150, not 144, let me hasten to add, I notice. The reason that it adds up to six more than 144, the authorized level, is because with the 144 you have always got a work force. You have got some people coming and going and reassignments, so you are always going to have a pool of vacancies you intend to fill. We have got six over the authorization levels. At all times they will stay at 144 or less, I am sure.

Now, we have, I think, with a grand total of 12 positions listed as vacant, in fact got an awfully good story to tell at the moment on this issue. It is the case, however, as your subcommittee staff brought to my personal attention earlier this week, that we have a concentration, for the moment, in ADL of SES vacancies, and in checking on that and preparing for the hearing, I learned that—and was very relieved, particularly after your previous question—none of them were stuck in OST. I learned that the FAA leadership, for reasons that I think upon review make good sense, had been in part waiting for the appointment of the new associate administrator in that shop, Mr. Ed Harris—he has now been in place for at least several weeks—and are continuing to review the overall management of that office.

We can certainly ask Mr. Pozesky if it would be useful—I don't know how far you want to go into this—to talk specifically about why and which jobs, but the bottom line is I do understand that in ADL they are moving very actively on this issue at the moment and that, in fact, paper will start showing up over at OST fairly shortly on some or all of these positions.

Again I reiterate, though, that overall we are, I think, in awfully good shape when you have 144 authorized positions and 12 vacancies.

Mr. McCURDY. So obviously there has been some movement in recent months.

Mr. BURNLEY. Yes, sir.

Mr. MCCURDY. There has been some activity there. That is good. We appreciate that answer, and with all due respect to Mr. Pozesky, we don't want any more slide charts right now. We had a good session.

The 1982 Aviation Act requires publication of the National Airport Plan every two years. The next plan is due in 1987. When do you plan to publish this?

Mr. BURNLEY. I don't know off the top of my head.

Ms. HALE. It has been going through review. My office has been looking at it. We are working with FAA, and I would anticipate quite soon.

Mr. MCCURDY. Mr. Lewis, do you have any further questions or follow-up?

Mr. LEWIS. No, I don't at this time, Mr. Chairman. I maybe want to touch on one that you may not want to talk about on mergers. Has DOT really taken a strong look at the mergers as they are today? It looks to me like at the rate we are going, we are going to wind up with about five airlines in this country.

Mr. BURNLEY. Congressman, let me say—I am perfectly happy to talk about that for a moment. Let me first note that Secretary Dole in 1984 urged the Congress to assign the merger review authority upon CAB Sunset to the Department of Justice. We do not historically as an agency have experience and did not have great numbers of people on the premises with anti-trust expertise. The Congress in its wisdom sent it to us anyhow when the CAB Sunset occurred January 1, 1985.

There have been proposals floated in recent days in the Congress to accelerate the date upon which it would go over to the Justice Department, and we have jumped at every opportunity to support those proposals because we still think, as we thought in 1984, that is where it belongs. However, let me strongly emphasize that while we have got it, we have tried to carry the responsibilities out conscientiously, and we have gone at these merger reviews one at a time, we have done them on the records that have been put before us, we have certainly seen in the last 18 to 24 months a wave of mergers, and there clearly at some point—and we may be there now, I don't know. I don't know what is coming next, if anything. At some point you would expect that that wave would ebb, that the industry would reach a point where you had certain forces that were counteracting the merger forces.

We still have got very intense competition, and you see—and I remember back in late January, early February there were a series of stories in the press of people speculating about whether we were going to end up with much higher fares across the board because of the recent number of mergers, and lo and behold, right in the middle of a wave of such press speculation, Continental announced the maxi-savers and a price war broke out in a major way.

In recent days you have seen stories speculating about whether the airlines could sustain those lower fares at the maxi-saver levels over the long term, and apparently they as an industry are doing reasonably well and selling a lot of seats that they might not have otherwise sold.

So I think if you look at the big picture, you have still got very intense competition. The problem that we also continue to watch, and it is an area in which our merger oversight authority is not necessarily the relevant authority—it is more of a consumer affairs authority, perhaps—is, once a merger is under way, how well do the two airlines put themselves together?

We have had some shining examples, we think, in the last year or two where that has been done well, and we have had a couple of examples where they haven't done it very well at all and there have been very substantial merger difficulties when they actually put the operations together.

The FAA is particularly vigilant on the safety and maintenance oversight side on such situations, and they really do look more closely if they detect even the slightest sign of difficulties in that regard.

Mr. McCURDY. May I interject at this point? I just want to follow up on Tom's question, and that is how would you, if you had to classify the state of the health of the airline industry today, how would you classify it?

Mr. BURNLEY. I think it is healthy as an industry, but it is also, again, in a state of rapid change.

Mr. McCURDY. How would you classify the service that the consumer gets in the airline industry today?

Mr. BURNLEY. It varies dramatically from one carrier to another, Mr. Chairman, and lately it has been real crummy on a couple of these carriers that have been going through merger pains. It stinks. We have got discussions and have had them under way for some weeks now with a couple of these situations in particular, these carriers, with senior management about those problems. We are very interested and will not hesitate to take further steps if they are not going to get sorted out quickly.

Mr. McCURDY. What kind of steps can you take?

Mr. BURNLEY. What we can do ultimately, and we have enforcement authority, if an airline develops a pattern in the area, say, of bumping rights, of not giving people their rights, if you can prove economic cancellations—in other words, the airline decides not to fly because they didn't sell enough seats on that plane that day, if you can prove a pattern of those—well, you know, we hear stories and allegations, and some of our employees have even thought a couple of times they might have been on such flights themselves that got cancelled for reasons other than those that were announced, but you have got to be able to prove it before you go enforce against somebody. But we do have ultimately enforcement authority.

As you have seen recently with respect to the scheduling exercise, we are ever less hesitant to address those issues aggressively if the airline is not able to work them out. I will say this. It is overall still the case, in my judgment, that even though we have got some unfortunate stand-out examples at the moment of bad service problems, that service is pretty good overall. You don't have to take my word for it. There was this recent ABC/Washington Post poll where when asked that question, are you basically satisfied with airline service, among people who flew one or more times a year,

as I recall, 80 percent said yes. But there are problems, nonetheless.

Mr. LEWIS. Then the whole 20 percent must be calling my office.

Mr. BURNLEY. They call us, too, Congressman. Again, I don't want to understate the fact that the trend has been with a couple of carriers recently in precisely the wrong direction, and we are in discussions with them about that.

Mr. LEWIS. Following up what the chairman was alluding to, I wonder just what does DOT do when you are looking at an airline merger? Do you factor in the problems that passengers may encounter when this merger takes place? You mentioned that you do certain things after the fact, but how about doing it up front before the merger takes place? Some of these situations are absolutely hideous.

Mr. BURNLEY. Yes, sir. We have for the first time——

Mr. LEWIS. Let me say one other thing before you answer that. It is true there is a lot of competition out there amongst airlines, but at the same time, there isn't any other competition for the airlines. If a person wants to get from Point A to Point B today, he must in most cases go by air, so he really doesn't have any choice, he or she, and the airlines recognize this, too.

I think it is very unfortunate. I am a firm free enterprise person, but at the same time I think that if we are going to approve mergers and things like this, we should factor in the human relations problems and the consumer problems that potentially could take effect. Some of these things with—you haven't mentioned them, but I will—Continental and Peoples and Northwest and a few others recently are absolutely—it just makes me angry to think about them. They just don't give a damn, quite frankly.

Mr. BURNLEY. Congressman, with respect to the question about looking on the front end as a part of the review, we have for the first time, in the order that was just issued on U.S. Air/Piedmont's proposed merger, asked for data in just that area. Yes, we are going to try to take a serious look at it.

Mr. LEWIS. They have probably got the two best records of the bunch of all of them that have mergered.

Mr. BURNLEY. Well, we haven't singled them out, but it is because of the very problems that we have been discussing here that we have seen in some other recent mergers. It is not going to be just them, in other words. But we are going to try to seek additional information on the front end.

The problem is, though, that everybody—the have the best of intentions. I don't think there is an airline in the country that consciously sets out to lose your baggage, leave you stranded on the tarmac and get you home two days late. I don't think that is the sort of policy that they sit around the board room and vote on. So they will put before us, I suspect, in the future plans with the best of intentions to carry them out in this regard.

Obviously, to the extent that the airlines are having trouble making a merger work, it is probably going to cost them money. It may not be in precisely the area that causes you and me and other travelers anger, but it is going to mean that they are not operating efficiently. So they have got some internal incentives as well, I think, to try and make it work.

Again, there are a couple of shining examples that you have mentioned and I haven't named that haven't worked very well. As a result of that, we are beginning to pay, on the front end prospectively in looking a merger proposal, more attention to that area.

Mr. LEWIS. In your looking at this, do you look at the same time at the employees of those airlines as to what the airline's responsibility is going to be to the number of personnel that are going to be terminated or transferred? This is where you get into the problems with lost baggage and things like this because those people don't care, and they don't know from day to day whether they are going to be working for this airline or out of a job, and they see themselves, 20-year employees, bumped to another city and have to pack up and move everything.

I don't know whether it is your responsibility to look into that, but that is one of the problems that we have, and the American consumer is the guy that takes it on the chin for it.

Mr. BURNLEY. Congressman, we do not view that as within our purview. We do have a responsibility under the statute to look at the labor protection issue, and it is to be looked at in terms of the overall impact of the number of jobs in the industry. We look at it on that basis, and we continue to be of the view that you are going to get, hopefully not in the very long term, but certainly in the long term, a better outcome to the extent that labor and management negotiate these issues out and resolve them, versus us coming in by edict.

So our statutory responsibility is to look at impact on employment levels overall. In some of the recent mergers, you have seen seniority rights as a real irritant, if I understand what I see in the press. I think we would be very ill-equipped as a department to try to sit down and work out a seniority rights list, but nonetheless, again we are looking at merger plans in a little different light henceforth, as we have just said in this order on U.S. Air/Piedmont.

The question of are you going to make it work will include are your employees going to show up and are they going to load the baggage on the right planes? So a part of the plans we will be looking for ought to address those kinds of operational issues.

Mr. LEWIS. If the fine for a safety violation is $500,000, why does the FAA negotiate with the airline to allow them to reduce that fine? Why shouldn't they pay the $500,000? I recognize that maybe they are marginal financially, but the safety of those passengers should not be marginal.

Mr. BURNLEY. It has been the FAA's experience, Congressman, particularly during this recent period when the enforcement has been tougher, and visibly so, that we want, to the extent we can—we have got to have an arm's length relationship but it has got to be a working relationship with the airlines, and we want to encourage them to do everything that our rules say they ought to be doing on the safety side. Some days you encourage them in a cooperative way, and when that doesn't work, other days we use a 2 by 4 and the fines are the 2 by 4.

We have a very elaborate recordkeeping system required because, given the number of maintenance issues that we require the airlines to track, there is no way in the world you or anybody else

in the Congress would ever want us to spend the kind of money it would take to have a Federal employee standing there watching literally every plane as routine maintenance is done on it, 24 hours a day, seven days a week.

So we have to be able to go in and look at the records, and the records have to be comprehensive. When you have seen these reports of thousands of violations in recent months, in the overwhelming percentage of cases those violations are in the recordkeeping category. Now, they are terribly important to us. If the recordkeeping breaks down, again, we can't have our folks do what they are supposed to do and we can't tell whether the maintenance is being done properly or not. So we do have to make sure they do the paperwork that is required.

But the FAA inspector workforce up to the Admiral make judgments about how best to get an airline that has problems in this area straightened out and straightened out quickly. Those judgments include setting a figure and doing what is often done in enforcement cases of all shapes, kinds and varieties in this country. If I recall correctly, I believe the chairman once did some prosecuting. It is a little bit like plea bargaining. You set it here, and if you are getting a cooperative reaction and they are fixing the problems quickly, you take that into account as you work it out.

Let me note that today we can only fine an airline $1,000 per violation, regardless of how egregious that one violation is. Last year we came to the Congress and asked that that be raised to $10,000, and that request is pending. We sure hope we can get the Congress to write the necessary legislation for us to give us the $10,000 maximum versus $1,000 a day to permit the FAA, where you have got an airline that is guilty of substantial violations of our maintenance requirements and who doesn't have a cooperative attitude, to further get their attention. It is a much bigger 2 by 4.

I want to emphasize again that these are judgments that are made in the overall context of making sure you get the highest possible levels of maintenance.

Let me make one other point. These are judgments during the time that Elizabeth Dole has been Secretary and the time I have been at the Department that are made strictly within the FAA. We don't get into them. We do not view that as an appropriate role for OST to try to second guess anybody in the FAA.

We leave it with the Administrator and his folks. We obviously are very interested in what is going on and pay close attention, and we have been entirely satisfied with the way in which the FAA has gone about these much tougher inspections in recent months. Of course, it was Secretary Dole's "white glove" inspection process that kicked off this whole exercise about three years ago. She and the Administrator decided that we were going to go in and really intensively go over the major carriers one at a time, and that, in turn, has led to all sorts of other changes and really a major revamping of how these inspections are done. It is having, I think, a very dramatic impact in just the ways you would want it to, and that is on the improved safety side.

Mr. McCURDY. Thank you, Mr. Secretary. We don't have to worry about 2 by 4s on this subcommittee because we have a person who is famous for his elbows.

We've got an enforcer here that is a very good committee member, and certainly he's going to be a shining start in the Congress, as well as he was in the MBA, and at this point, I would recognize the gentleman from Maryland.

Mr. McMillen. Thank you, Mr. Chairman.

And I might add that I used those elbows in my previous eleven years in another occupation where I must say that I flew around the country, and I think I visited every major airport many, many times.

Mr. Burnley. You got out just in time. I see in the papers this morning, there were several new airports added to the list.

Mr. McMillen. One of the things that I, you know, saw in those eleven years was the increase in traffic and congestion and delays, partly due to deregulation, partly due just to the demands on the system. But as a consequence to that and because of an airport in my district, I think I've become more acutely aware of a real problem that so many airports face, and that's the noise pollution problem.

You know, I have Baltimore-Washington Airport in my district. The chairman came out recently to see the airport. It's 3000 acres built 30 years ago, 40 years ago, and all of a sudden the common market between Baltimore and Washington is exploding, and there's nowhere for this airport to go, and obviously the noise problem is a problem that is creating a great deal of human tragedy out there.

And one of the things I'd like to do for the record is just get some of your ideas and thoughts on this subject, what can be done. I see that you have asked for a $600,000 increase in the environmental category here to study an analysis of noise from last year's appropriation, and I'd just like to know, what's being done in that area? What are you using those funds for, or what do you think can be done about airports like BWI, who are facing these critical problems?

Mr. Burnley. Congressman, if I may, I will provide for the record the specifics on the $600,000, because I don't have those stored away between my ears.

[Information to be furnished follows:]

ENVIRONMENTAL ASPECTS OF FISCAL YEAR 1988 RE&D BUDGET

FAA's FY 1988 RE&D budget requests $2,197,000 in funds to support environmental activities. These funds will be used to develop aircraft noise standards, predict and measure noise, assess airport noise compatibility with surrounding land uses, and to conduct studies to reduce air pollution associated with aircraft and airport systems.

Mr. Burnley. But let me answer your question more generally, if I might.

It is a very tough issue that is not going to go away, and so far as I am aware, there are no perfect answers, and so we've got to try a variety of approaches.

This does not take care of the situation that you now face with BWI, but certainly to at least cap this problem, we need to continue to look at devices that properly respect the roles of the states and local communities. I do not think the Federal Government ought to come in and just preempt in this area.

But nonetheless we've got to be working with states and local communities to be sure that as new airports are built and existing facilities are expanded, that the folks who are in charge of zoning decisions and land use decisions are sensitive to what can happen 30 years out, because a great many of these problems are as a result of just the kind of growth you've described, where the airport was built out in the country some years ago, and then suddenly suburbia showed up.

Now as to existing problems, as you know, under the '82 Reauthorization Act, 8 percent of our airport improvement grant funds are dedicated to noise-related projects, and we've used that money in a variety of different ways. And I know that when Admiral Engen was here a month ago that you and he discussed this issue in some detail.

In some instances, literally the funds have been used to insulate houses, schools, what have you, but that, as you would expect, is a terribly expensive proposition when you're talking about an area that is quite urbanized. You've got a lot of buildings, and the costs get very high. You have to go in and rip out walls and that sort of thing.

The other area in which we see some opportunities in the years to come are in addressing—and the NAS plan will certainly help us in this respect—addressing in part the flight paths. As I think Admiral Engen testified a month ago, when we tried, as we all recall, to disperse the traffic in and out of National Airport in the early '80s, we found that we had greatly enlarged the number of people who objected to noise, and that didn't work at all.

On the other hand, there may be cases where changing flight paths and dispersing traffic will work in a given locale around a particular airport.

The other area that I know you have an interest in is what we're going to do in the long term about Stage II, Stage III aircraft, and clearly we've just gone through this exercise that had some pain attached to it on phasing out Stage I aircraft in this country. To this day, we have some members of Congress urging us to grant exemptions to a couple of airports, so old planes can be flown in for maintenance work, and we're looking at those kinds of requests right now.

But over time, it may be that a major part of the answer is going to be quieter aircraft. I would caution the Congress, however, about rushing or putting the heat on us to rush on phasing out all the Stage IIs overnight and going to Stage IIIs, because the capital costs are enormous. One estimate I've seen recently is, if you put us on a track where we were going to do that before the airplane's natural service life ended, you're talking about $9 billion in additional capital costs that you put on the airline industry, over and above the capital costs they're going to incur in the routine course of events. And I think we would all want to be careful before we reach a quick conclusion that that was just exactly what you wanted to do overnight.

One other aspect of this that's important. In our reauthorization proposal, we have dropped the earmark on noise projects from 8 percent, and the reason is that we think we can do a better job in addressing issues, just like the situation you describe at BWI, if

we've got a little more discretion to look at airport capacity issues, because noise is an irritant to the people, but from the standpoint of the FAA and the airport itself, it is a capacity issue, because people object to the noise, and they're going to do something about the capacity of the airport. They're going to curtail it.

And we think that that might, in fact, result in us having more flexibility that could result in doing a better job in this area in the years to come in addressing noise problems. There is no, as I said before, one right answer to this problem, and I know Admiral Engen, when he was here a month ago, offered to work with you personally on the Oxon Hill situation and the BWI noise problems, and I hope and assume that that is exactly what's happening.

Mr. McMillen. Well, the concern that I have is that obviously you have these airports that at a given point in time, maybe five years ago, ten years ago, particularly in the Baltimore-Washington Airport situation, the citizens were not mobilized, they were not as concerned, because it was a livable situation.

But what has happened in the last few years is it's become intolerable, and the question is, as you're talking about, you know, putting these extra costs on the airlines, which eventually will be passed on to the traveling public, but the fact is, who is absorbing these costs but citizens who are living—the human costs and economic costs associated with this—but the citizens living around those airports.

And I feel that we need—I feel that we need with airports like Baltimore some stronger measures. To give you a point in fact, I've heard numerous complaints that you have a contour map that's drawn, that's put forth, and planes routinely do not follow those contours. They embank quicker than they're supposed to be. In the case of Baltimore, they're flying over schools who don't have air conditioning, so they leave their windows open in the warm weather. Even if you insulated the schools from noise, it wouldn't do any good. And it's making the situation a lot worse.

I don't know what the answer is, but I've asked my colleague, Norm Mineta, to write the FAA, to make sure that these contour maps are adhered to and to make sure that we have the kind of enforcement that's necessary to protect these communities.

You know, I for one, you know, understand the importance of airports, but I also have many, many of my constituents who are very, very upset about this, and I would like to see a little more—a little more action in this regard.

Mr. Burnley. Well, we are certainly most interested, if there are specific allegations of violations of those contours and getting data on that, because we do take enforcement in that area seriously.

Let me make a suggestion, if I might also. I don't know whether your travel plans are going to take you to San Francisco any time soon or not, but in 1983, shortly after I came to the Department, I visited the San Francisco International Airport because the then-Chief Counsel to the FAA said that that was really one of the standout facilities in this country in addressing noise problems, and their problems are perhaps as acute as the problems at BWI, because they've got a natural valley right there, and they sit on the edge of it.

And when they built the airport, again 30, 40 years ago, the valley was farmland, and today it's very dense single-family housing for the most part.

It is the case that there are a lot of things that the airport operator can do, and it might—we'd be happy to assist in making the arrangements—it might be very much worth your time, the next time you're going in that direction, to spend a couple hours with the manager of that facility, and just let him show you what they've done and perhaps arrange to take some folks from BWI out there, because I'm not familiar with the details of what BWI has done in recent years to address this issue as an airport operator, but there are some real creative minds in this country working on this issue, and it might be worth taking the time to go see those folks.

Mr. McMILLEN. Thank you very much. Thank you, Mr. Chairman.

Mr. McCURDY. Thank you, Mr. McMillen.

I just have one last question for the record, and you can supply a written response, if you'd like, or if you'd like to take a second and respond to it.

Congress has pressed for accelerated development and procurement of terminal Doppler radar; 100 are required for a cost of $500 million, and in the '88 budget, 24 are requested for $130 million.

What are your long-range plans?

Mr. BURNLEY. Mr. Chairman, whether I do it now or for the record, it will be the same answer, so I might as well do it now.

We asked for 24 in the FY '88 budget. We got 24 through the budget process, and we will be asking for more. And so long as Elizabeth Dole is Secretary of Transportation, I can tell you to a certainty that she is going to want to move as aggressively as the technology will permit us in purchasing these units and putting them in airports where they will be useful.

We do have a long-range plan of looking at the needs for—what is it, 110, Marty, altogether—102 Doppler installations. We also are looking at the issue of whether we need to buy some additional land because of the angle at which you need to station them to maximize their effectiveness.

But all I can say to you is, we've got everything we asked for for terminal Doppler in '88. We intend to keep asking. We got everything we asked for from OMB, let me say. We hope the Congress will give us everything we asked for. We intend to keep asking. And this is an area in which the Secretary and I and certainly Don Engen, as the Administrator, are not the least bit hesitant to go get whatever it makes any sense at all to put in place.

We think this is a terribly important project, and it's an area in which we are optimistic that in the not very distant future, we will reduce the number of fatalities in commercial aviation and general aviation by putting units in where there are significant problems.

Mr. McCURDY. Very good. Well, it is a significant problem, and there are a lot of advances to be made in Doppler technology. As a matter of fact, the National Severe Storms Laboratory in Norman, Oklahoma has been the lead in research on NEXRAD and other areas of Doppler research, and we'd certainly welcome you at any

point, if you're out in the Southwest, to visit that. We'd love to have you there.

Mr. BURNLEY. I'd like to do that.

Mr. MCCURDY. I think on behalf of Mr. Lewis and myself and the full subcommittee, we'd like to again thank you for your appearance today and commend you for your statement and your frankness and honest approach, and I think it certainly has helped us establish a record on a number of issues which are important, that we can use when we're looking at some of these long-range policy questions.

And again, I think you've handled yourself very well, and we certainly appreciate your willingness to come this afternoon.

Mr. BURNLEY. Thank you.

Mr. MCCURDY. Thank you.

With that, we are adjourned.

[Whereupon, at 3:47 p.m., the hearing was adjourned.]

APPENDIX

AIRPORT OPERATORS COUNCIL INTERNATIONAL

TESTIMONY BY

J. Donald Reilly, Chairman

of the

INDUSTRY TASK FORCE ON AIRPORT CAPACITY IMPROVEMENT AND DELAY REDUCTION

on the

REAUTHORIZATION OF THE FAA RESEARCH, ENGINEERING AND DEVELOPMENT PROGRAM

before the

Subcommittee on Transportation, Aviation and Materials

Committee on Science and Technology

U.S. House of Representatives

March 24, 1987

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STATEMENT OF J. DONALD REILLY, EXECUTIVE DIRECTOR/SECRETARY GENERAL OF THE AIRPORT OPERATORS COUNCIL INTERNATIONAL, AND CHAIRMAN OF THE INDUSTRY TASK FORCE ON AIRPORT CAPACITY IMPROVEMENT AND DELAY REDUCTION, BEFORE THE HOUSE SUBCOMMITTEE ON TRANSPORTATION, AVIATION AND MATERIALS

Mr. Chairman and Members of the Subcommittee:

I am J. Donald Reilly, Chairman of the Industry Task Force on Airport Capacity Improvement and Delay Reduction. On behalf of the Task Force members, I am pleased to present this statement regarding the need for airport research and development funds through the FAA's Research, Engineering and Development (R&D) program.

A lack of airport capacity is the root-source of today's aviation congestion and delay problems. This lack will become more evident as the national airspace modernization program (NAS Plan) comes on line. Our problems will only compound as capacity in airspace grows more quickly than at airports. Airport congestion continues to grow dramatically and will become the primary civil aviation bottleneck, contributing to long and short term delays and potential safety problems.

This situation is critical and must be addressed by Congress in the reauthorization of the Airport and Airway Improvement Program of 1982. A post-FY 1987 airport/airway program expand airport and airway capacity by increasing funding for Facilties and Equipment and the Airport Improvement Program (AIP). This program should also provide a new separate line item for airport R&D funding to develop

and explore the full capacity potential of our nation's airports. AOCI and other organizations have presented various proposals to Congress for reauthorization of the airport/airway program which share the common goal of increasing aviation trust fund levels overcoming the constraints of the current program. (AOCI's joint proposal with the American Association of Airport Executives is attached for the record.)

Need for $25 Million Airport R&D Line Item

As currently administered within FAA, all research funds are controlled by the office responsible for modernization of the National Airspace System. Because of internal FAA priorities for the NAS Plan, nearly all R&D monies have been expended for airspace "black box" oriented research. Only a very minor percentage of R&D funds has been devoted to any airport-related needs.

To overcome this problem, the post-FY'87 legislation should clearly provide a specific authorization of $25 million annually for Airport Research and Development within the Research, Engineering and Development Program. A separate line item within FAA's R&D budget should be established for this airport R&D to assure these funds are dedicated to this purpose. At present, the miniscule funds available for airport-related R&D falls under the Air Traffic Control line item, which makes any commitment to airports difficult if not impossible to track.

Industry Task Force Initiatives to Increase Airport Capacity

A number of technological and operating procedural concepts exist today which, if appropriately developed with airport R&D funds, can be introduced in the short term to enhance airport capacity. There are also various technological innovations available to provide larger increases in airport capacity over the longer term.

Many of these concepts have evolved from the Industry Task Force on Airport Capacity Improvement and Delay Reduction. This Task Force is comprised of representatives from major aviation industry groups who share the common goal of maximizing capacity of our airport and airway transportation system. (A list of Task Force members is attached.) The Industry Task Force presented its first report to FAA on September 29, 1982. Since that time the Industry Task Force has held numerous meetings to refine further its airport capacity improvement recommendations for the FAA.

The FAA, through Administrator Engen, has been very supportive and active in this Task Force effort. However, because only a miniscule amount of research and development funds have been made available for airport capacity R&D, progress has been tortuously slow. We cannot afford to delay any longer.

This crying need deserves -- and demands -- Congress' immediate attention. On behalf of the Task Force and its members, we ask for your support to provide the necessary airport R&D funds for the programs described in this statement. We are not asking for funds that do not exist. We ask for funding from the $4 billion-plus uncommitted aviation trust fund surplus that already exists and is lying fallow. These funds are needed to further research,

simulate, demonstrate and implement Task Force recommendations agreed upon by the industry representatives, including high accuracy radar sensors and associated computer needs.

These Task Force concepts will produce high pay-offs in providing the absolutely critical increased airport capacity and safety needed for the late '80s and early '90s. Without funding these needs, the relative chaos we experience today at many of our major airports will spread dramatically, compromising the nation's civil aviation system and impacting safety.

Airport Capacity and Congestion Problems are Growing

Since deregulation, domestic enplanements have increased for air carriers from 278 million in 1978 to 415 million today, and will likely grow to 700 million by the year 2000. Moreover, the FAA projects that total aircraft operations will increase 62 percent between 1984 and 1996.

Total aircraft operations at the top 39 U.S. airports are forecast by FAA to rise by one-third in the 1980s and, assuming no change in the existing capacity of these sites, average delay per operation may grow by as much as 47 percent. The combined effect of increased operations and increased average delay could be to raise system-wide air carrier delays up to 39 percent. These delays exact a tremendous price of over $4 billion in annual costs to airlines, shippers and passengers annually.

In 1985, 17 larger hub airports were seriously congested and, many as we know, experienced high levels of delays. By 1990,

congestion at these airports alone -- which involve over 43 percent of all air carrier enplanements -- could degrade overall capacity of the national transportation system. By 1990, another 13 large hub airports are expected to exceed their practical annual capacity and become congested. In addition, 31 medium and smaller hub airports will be seriously congested by the year 2000 unless immediate steps are taken to increase capacity.

Forcasts by FAA indicate that the number of airports with severe airside congestion, alone, will be as follows:

Year	Air Carrier	Commuter	Reliever	General Aviation	Total
1981	8	--	3	--	11
1985	11	1	7	--	19
1990	23	5	11	2	41
2000	46	9	29	7	91

Clearly, air transportation demands have grown dramatically and will continue to grow; yet the capacity of our airports has not kept pace and is now strangling the aviation system. According to U.S. DOT/FAA's Airport Capacity Enhancement Plan (1986):

> "At many airports, the projected traffic levels cannot be accommodated without creating or adding to congested conditions. As air traffic expands over the next decade, it seems inevitable that airport users will experience longer and more costly delays unless capacity improvements are made."

Airport Capacity R&D Projects

Last year the Industry Task Force requested $15 million from Congress for airport capacity R&D needs but received only $5.5 million in the FY 1987 DOT Appropriations bill. Those monies have been well spent for the following FAA/Task Force projects:

a.	SIMMOD airport modeling	$ 420,000
b.	JOLINE airport surface model	350,000
c.	East coast plan	460,000
d.	MLS procedures	15,000
e.	Parallel runway data/demo	2,800,000
f.	Wake Vortex demo	100,000
g.	Pavement design/material study	390,000
h.	Terminal design	150,000
i.	West coast plan	400,000
j.	Contract support	420,000
Total		$5,505,000

While the Task Force continues to develop further and cost-out various concepts, the following are immediate, documented airport R&D needs which must be funded in FY 1988:

a.	Parallel runway program	$2,800,000
b.	Converging runway program	5,000,000
c.	Mode S enhancements	2,500,000
d.	Aircraft performance data collection	600,000
e.	Airport data	200,000
f.	SIMMOD	300,000
g.	JOLINE Machine	500,000
h.	Model development	300,000
i.	Individual airport capacity studies	925,000
j.	Pavement design and materials	7,320,000
k.	Runway hi-speed exits	780,000
l.	Safety support systems	337,000
m.	Airport visual control	720,000
n.	All weather taxiway guidance	560,000
o.	Aircraft ground performance	1,100,000
p.	Terminal area automated control	3,500,000
q.	ATC surface automation techniques	1,100,000
r.	Wake vortex	1,600,000
s.	MLS siting analysis	200,000
t.	Cockpit traffic information	300,000
Total		$30,642,000

These R&D projects include some of the following benefits:

1. Reduced Aircraft Longitudinal Separation: To safely reduce IFR spacing between aircraft in-trail during landing approaches from the present 3 to 5 n.m. down to 2 to 2-1/2 n.m. on a regular basis. Depending upon airport flow and configuration this separation can add up to six flights per hour.

2. Independent Parallel IFR Approaches at Reduced Spacing: With today's technology it is possible to reduce safely spacing between parallel runways from the current 4,300 feet to as low as 3,000 feet, providing the opportunity to construct new runways on existing airports. Spacing and purchase of an appropriate radar with higher revolve is imperative to early implementation of this program.

3. Independent IFR Approaches to Converging Runways: Many airports will benefit from the introduction of independent aircraft operations to existing converging runways. Effort is needed to develop the procedures, establish the requirements and validate the methods for enhanced operating minimums.

4. Use of Short Runways and Triple Parallels: In order to conduct FAA analysis of optimum application of Mode S, MLS and sensor technologies to introduce shorts and triples for enhanced airport capacity.

5. Data Research: Data collection research must be established on pilot reaction to missed approaches for establishing procedures on closely spaced parallels and converging runway operations.

6. Terminal and Airport Automation: Parametric studies will establish optimum methods of terminal and airport automation.

7. Computer Modeling: While the FAA is providing funds to upgrade the ADSIM computer model which addresses detailed airfield capacity options, funding is needed for:

SIMMOD - an airport air space computer model which analyses air space options to enhance capacity.

Joline "Airport Machine" - an airport display computer which provides quick "fast-look" evaluations of specific airport capacity options.

8. Local Airport Capacity Task Forces: Funding is needed to support local airport capacity task force costs (FAA, airport, and local aviation users) to examine, evaluate and introduce local capacity enhancements after computer simulations. The average cost per airport is some of $160,000.

9. Funds to Support Task Force Applications: As important as the development and FAA approval of Task Force recommendations are the analytical studies for airport site specific application of the various capacity enhancement techniques.

10. Airport Pavement R&D: Airport runway outages account for some 20 percent of total delays. There are about 650 million square yards of pavement at U.S. airports representing a replacement value estimated at $100 billion. 60 percent of the annual AIP grants are spent on pavement. Yet there are no R&D monies for maintaining and improving the existing facilities and supporting research to reduce

or resolve problems contributing to runway construction delays at congested airports. The FAA must undertake a long-term airport R&D program for improved runway pavement technology, materials and construction techniques, control of snow and ice, improving operational capabilities under low visibility, airport lighting systems, airport system controls, wind shear, etc.

Mr. Chairman, in concluding, we request your urgent attention to this pressing need, and the action of this Subcommittee to help provide the airport R&D funds required in airport/airway reauthorization legislation. We believe this funding must be provided through a new and separate "Airport R&D" FAA budget line item to protect the use of these important funds for its intended purpose and assure that airport R&D needs are no longer neglected.

Thank you.

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STATEMENT

OF THE

NATIONAL BUSINESS AIRCRAFT ASSOCIATION, INC.,

ON

REAUTHORIZING

RESEARCH, ENGINEERING AND DEVELOPMENT PROGRAMS

ASSOCIATED WITH THE

NATIONAL AIRSPACE SYSTEM PLAN

SUBMITTED FOR THE RECORD

TO THE

SUBCOMMITTEE ON TRANSPORTATION, AVIATION AND MATERIALS,

COMMITTEE ON SCIENCE SPACE AND TECHNOLOGY,

U.S. HOUSE OF REPRESENTATIVES

MARCH 30, 1987

member of ibac international business aviation council, ltd

NATIONAL BUSINESS AIRCRAFT ASSOCIATION, INC.

Mr. Chairman and Members of the Subcommittee:

NBAA represents the aviation-related interests of American Business. Our 2900 member companies own and operate aircraft for use in meeting their daily business transportation requirements. As they are regular users of the airspace and of airports, the National Airspace System Plan (NASP) and its promise of greater efficiencies for users is of vital importance to us. We appreciate the opportunity to submit this statement for the record of hearings on the Research, Engineering and Development portion of the renewal of the Airport and Airway Improvement Act of 1982.

OVERVIEW

The following parts of the NASP are of great interest to business aviation:

- The modern, high-speed computer hardware found in the Host Computer program is essential for the management of today's -- and tomorrow's -- complex air traffic control system.
- NEXRAD and Terminal Doppler Radar for weather observation are critical to aviation safety.
- Forced implementation of Mode 'S' data link communications may jeopardizes the continued expansion of altitude encoding or Mode 'C' equipage.
- Flight Service Station (FSS) Modernization has resulted in poorer service to users.
- Automated Weather Observation System (AWOS) will not fill the valid aeronautical need for winds and altimeter settings.
- The Microwave Landing System (MLS) program is in trouble.
- The Area Control Facility (ACF) concept seems to be headed for the same problems as have beset the Automated Flight Service Station (AFSS) program.

While not specifically included in the NASP, the two programs mentioned below are of interest in this discussion as they hold great promise in the area of capacity improvements without large expenditures of funds through efficient management of existing resources:

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- Reduction of the lateral separation for parallel approaches in Instrument Meterological Conditions holds the promise of improved airport capacity.

- Traffic Management and Flow Control improvements need attention and funding they cannot receive because they are not "Brown Book" programs.

THE NATIONAL AIRSPACE SYSTEM PLAN (NASP)

Overview

We support a strong program for continued modernization of the Air Traffic Control System, funded in part by the Airport and Airways Trust Fund. Full funding of all of the projects listed in the NASP is essential to the healthy development of the capacity necessary to meet the needs of air commerce for the foreseeable future. NBAA therefore recommends the full implementation of the NASP, with first priority given to those programs which will provide improvement in the margin of safety for operation in the nation's airspace. Next in priority should be those programs which will provide for the greatest incremental gain against the problems of delay and congestion in the airspace and at the nation's airports. Finally, programs which provide for efficiency in the operation of the air traffic control system, and which have been omitted from the Plan itself, should be accomplished in the most timely manner.

Safety Related Programs

Mode S Data Link

Operational Communications (ATC) are the most important and critical part of air/ground communications. At present, ATC communication techniques are rapidly becoming obsolete as others proliferate on frequencies used for

operational and safety services and passenger communications. In addition, ATC communications are seriously overloaded and a serious safety problem is in an incipient stage. FAA's dogged pursuit of Mode S has not only precluded developments to improve ATC communications, but also now threatens improved separation assurance in congested terminal areas which could otherwise be assured by Mode C. Forced obsolescence of Air Traffic Control Radar Beacon Systems (ATCRBS) so that implementation of Mode 'S' can be hastened provides a disincentive for aircraft owners to upgrade to ATCRBS transponders with altitude encoders, or Mode 'C'. We need greatly expanded numbers of general aviation aircraft to equip with Mode 'C' equipment so that collision avoidance devices, such as TCAS can operate more effectively. In addition, many observers believe the data link portion of Mode 'S' may already be obsolete when compared with current technology.

Therefore, FAA should:

1. Continue the installation of the Mode S antenna systems so that the ATC system may benefit from the advantages inherent in using monopulse processing techniques. These systems should be installed at locations that may benefit early due to the high density of air traffic.

2. Not install the data link portion of the Mode S system (in the ground equipment); the radars should operate only in Modes A & C.

   Note: This would mean that we would have an improved Secondary Surveillance Radar (SSR) system with increased accuracy, reduced risk of "garbling" due to the use of the monopulse processing technique, and a significantly earlier date of implementation.

3. Not force the owners of ATCRBS transponders to face a "drop dead" date for re-equipping with a Mode S transponder. Non-commercial aircraft owners will be less resistant to additional airspace where altitude encoders are required if they are allowed to obtain normal useful life from their ATCRBS transponders.

4. Begin development of a data link service that will contain the capacity needed to accommodate both user and FAA requirements. Initially, a

data link service that uses "selcall" and existing VHF frequencies will hasten implementation. In addition, FAA should begin work now to utilize the satellite communications technology so that ATC messages (including the use of automatic dependent surveillance) can be accommodated. This data link service should have coverage that is coincident with the limits of radar coverage.

Flight Service Station Modernization

Flight Service Station (FSS) modernization has resulted in poorer service to users. Although many business aircraft operators now bypass the FSS and rely on commercial sources for weather briefings and flight planning, they still must contact an FSS to obtain certain services in flight and to file flight plans. FAA is currently closing FSSs around the country to provide the staffing necessary for the "automated" stations without providing the promised "equal to or better service." Worse still, the new facilities are being commissioned with the old equipment, which lacks the promised automation, providing the user with the worst of both worlds.

The FSS modernization program needs serious management attention, and should be redirected in a manner to permit the customer to take full advantage of commercial services. The modernization program should embrace the most modern means for filing flight plans, that is, direct access through user operated terminals or home computers.

NEXRAD and Terminal Doppler Radar

These important tools for weather observation are critical to aviation safety. The majority of fatal accidents are caused by weather. NEXRAD will provide the very latest in weather radar technology, including doppler capability. Terminal Doppler Radar will provide major terminal areas with the capability to forecast and track wind shear phenomenon associated with

microbursts. Improvements in the quality and quantity of radar observations of severe weather phenomena along with near real time dissemination to flight crews should be integrated with the clearly understood goal of reducing the number of weather related accidents.

Automated Weather Observation System

We don't understand why, but the FAA has tried for years to eliminate Instrument Approach Procedures (IAPs) at airports without a local altimeter setting and located in areas of "non-homogeneous weather or precipitous terrain." Currently, instrument approaches to these airports are conducted by using a nearby altimeter setting and adding a penalty to the decision height. These airports, and the actual number involved is not known but is well over one hundred, have valid aeronautical need for a simple, low-cost device that will provide that one cherished piece of essential data, altimeter setting. These devices should, without human intervention, broadcast the local altimeter setting on available VHF frequencies. The only additional weather information required at these airports is wind speed and direction. This need is particularly acute at airports not served by control towers, or during periods when towers are not in operation.

The present, "deluxe," AWOS program will serve only to substitute for human observation at airports with towers and will only be affordable at major terminals.

Unfortunately, the cost of developing the AWOS systems now under development far outstrips the available resources. User requirements for the simple, low cost, current-technology systems have been obscured by the pursuit of the more exotic system.

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Programs Which Address Delays and Congestion

Host Computer

Modern, high-speed computer hardware is essential for the management of today's complex ATC system. Much of the delay in the en route air traffic system results from control techniques and computer limitations which keep aircraft apart from one another by separating them with huge blocks of airspace and keeping them clear of airspace reserved for specific control facilities or controller positions. Modern hardware is essential to development of air traffic control procedures which will provide optimum separation of aircraft and provide for the most efficient use of the available airspace.

It is therefore imperative that the old, antiquated hardware supporting the ATC system be modernized. We strongly support the prompt implementation of modernization, and the Host Computer is an essential building block.

Microwave Landing System (MLS)

MLS is a program in trouble. It is significantly behind schedule, but more to the point, woefully behind users' expectations for increasing the number of precision approaches.

NBAA has been a strong supporter of the MLS program. Our support has been based on the premise that MLS offered the opportunity for precision approach capability to many more airports with valid aeronautical needs for such service than could otherwise be provided by ILS.

Most of what strength of conviction we have has come directly from our membership. In an effort to determine our response to the continued changes to the MLS program, we surveyed the membership early last calendar year, and asked them to tell us the airports that they felt should obtain precision

approach service. The response surprised even the most optimistic on our staff. Over 400 member companies nominated 470 airports and 484 runway ends needing precision approach capability.

Given:

1. The first buy MLSs will only ever be able to support Category I operations,

2. No early benefit accrues either in terms of operational improvement or in terms of user inducement to equip with airborne receivers from the installation of first buy MLS on runways already equipped with Category I (or higher) MLS,

3. Installation of the first buy MLSs on runways that already have ILS or that will require greater coverage volume or lower minimums will result in added expense to the FAA when the first buy MLS must be removed and replaced with a newer generation MLS, and

4. Business aviation, through our survey, has indicated a valid aeronautical need for precision approach,

it seems only logical that the first buy MLSs should be installed at airports served by business aviation (and who have indicated their willingness to buy airborne equipment by responding to our survey).

These first generation, Category I-only MLSs should be installed at airports that do not have an ILS or that only have a partial ILS. This will result in early implementation of MLS, early operational use and experience gained by a segment of the aviation community that has demonstrated a valid need for the service, and reduced program costs for the FAA because these MLS systems will not have to be relocated at a later date.

The program needs serious redirection, and the FAA has begun this process. We have provided our input to the program review and remain optimistic that reason will prevail

Area Control Facility

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The Area Control Facility (ACF) program is aimed at consolidating approach control facilities with Air Route Traffic Control Centers. However, no universal user agreement that ACF is a beneficial program exists. In order not to repeat mistakes made in the consolidation and modernization of FSSs, an implementation plan must be developed to address both user and controller concerns that ACFs can provide the same level of service that the current approach control facilities do. An orderly transition program must be established so as to assure users that critical services will not be lost, something FSS modernization has sorely lacked.

PROGRAMS NOT INCLUDED IN THE NASP

Reduced Longitudinal Separation of Simultaneous Parallel Approaches

Reduction of the lateral separation required to conduct simultaneous parallel approaches in Instrument Meterological Conditions holds the promise of improved airport capacity. In order to achieve this, new sensors must be procured as current FAA radars are not accurate enough to do the job. An extensive development program is not necessary, but off-the-shelf hardware should be selected and bought.

Traffic Management and Flow Control

Traffic Management and Flow Control improvements need attention and funding they cannot receive because they are not "Brown Book" programs. New methods of managing traffic have been studied by FAA air traffic control personnel, but absent a specific NASP program, the Department of Transportation and the Office of Management and Budget have been reluctant to approve funding. Provisions should be made in the NASP for short-term, innovative solutions to persistent problems in traffic management.

NATIONAL BUSINESS AIRCRAFT ASSOCIATION, INC.

Subcommittee on Transportation, Aviation and Materials
U.S. House of Representatives
March 24, 1987

CONCLUSION

As an integrated plan, the NASP is behind schedule and underfunded. However, more distressing is the fact that the various pieces which comprise the NASP are the victims of inadequate management and are, in some cases, solutions in search of a problem. This is despite the fact the FAA contracted with a systems integration contractor at a cost of over a billion dollars to avoid many of these same problems. Sadly, if much more delay is suffered, benefit-to-cost ratios will sag further, making justification on such a basis next to impossible. Better management, on the part of the FAA, and ready sources of funding from the Congress will alleviate many of these problems.

As the Subcommittee begins the difficult process of drafting legislation to reauthorize the Research, Engineering and Development activities of the FAA, we encourage you to fully consider the need for proper integration and implementation of the aforementioned programs into the National Airspace System. Given appropriate guidance from Congress, the R,E&D phase of the modernization effort will go smoothly.

We stand ready to assist this Subcommittee and the FAA in the development of appropriate solutions.

Thank you again for the opportunity to submit this statement.

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